3D MultiVision MVL

SOFTWARE OPERATING INSTRUCTIONS

Accurate, reliable volume data from silos, open bins and warehouses where the diameters or areas are exceptionally large.

APM

Changing the market from level to volume

English

APM 3D Vision and 3D MultiVision Software Operation Manual

Version 1.0

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English

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About this Document

This software operation manual provides complete instructions for the quick setup and safe operation of the 3D Vision and MultiVision applications. This manual is designed for trained personnel. Read it carefully before you proceed.

By default, this manual refers to the single-vessel 3D Vision license. Unless otherwise indicated, all information applies equally to the 3D Vision and 3D MultiVision application licenses.

For information on upgrading from the 3D Vision license to the 3D MultiVision license, contact APM Solutions, Inc.

Document Conventions

The following conventions are used throughout this document.

Additional Information

Indicates additional helpful information.

Caution, Warning, Danger

Indicates a potentially dangerous situation, which could result in injury, damage, or a loss of information security.

For Your Safety

Authorized Personnel

All tasks described in this manual should be performed by authorized trained personnel only. For safety and warranty reasons, any internal work on the devices must be performed by manufacturer authorized personnel only.

Warning about Misuse

Inappropriate or incorrect use of the device can cause application-specific hazards, such as vessel overfill, or damage to system components through incorrect mounting or adjustment.

General Safety Instructions

The 3DLevelScanner is a high technology device requiring strict observance of standard regulations and guidelines. The user must take note of the safety instructions in this operating manual, as well as country-specific installation standards (e.g., the VDE regulations in Germany), and all common safety regulations and accident prevention rules.

English

1

Introduction

APM 3D Vision enables real-time assessment of inventories of bulk solids and powders stored in storage vessels of any type or size, providing managers with accurate and timely information on which to base critical decision-making for successful plant management.

APM 3D Vision works in conjunction with the APM's 3DLevelScanner non-contact volume sensors to provide measurement data to a Windows®-based computer. The application collects data from the monitored vessel and generates reports that can be used to increase operational efficiency and provide valuable real-time and historical data for effective decision making.

APM 3D MultiVision enables you to perform the same functions for groups of vessels, even across multiple sites. In conjunction with the APM's 3DLevelScanner non-contact volume sensors, 3D MultiVision collects data from all monitored vessels in all sites and geographic regions, combines and merges the data, and generates reports.

Managers and staff with appropriate authorization can view this information from any location in the world over a common LAN or wireless communication.

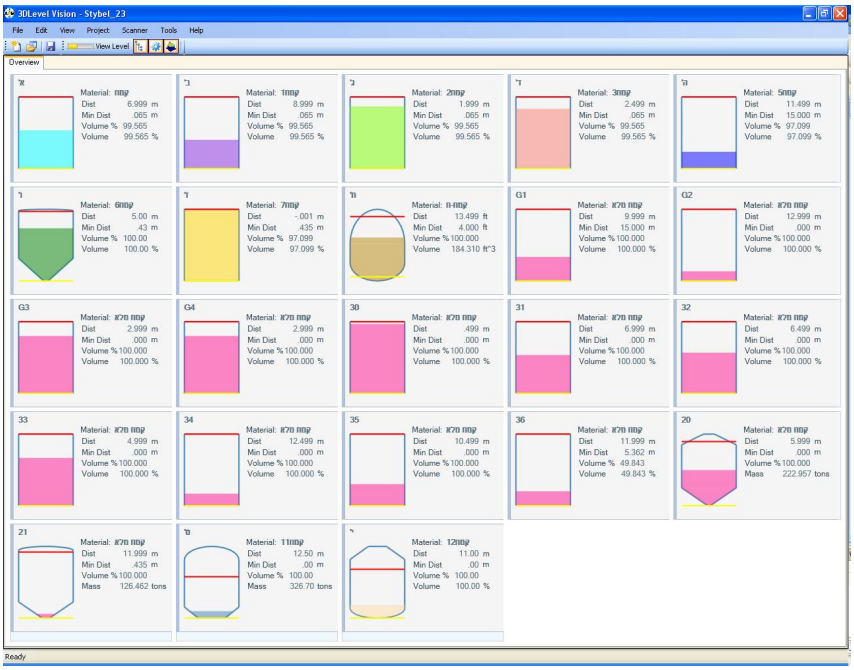


Figure 1 3D MultiVision Output Example

System Overview

The general configuration of the system is RS485 daisy chain connections between all 3DLevelScanners, ending in a connection to a controller (Figure 2).

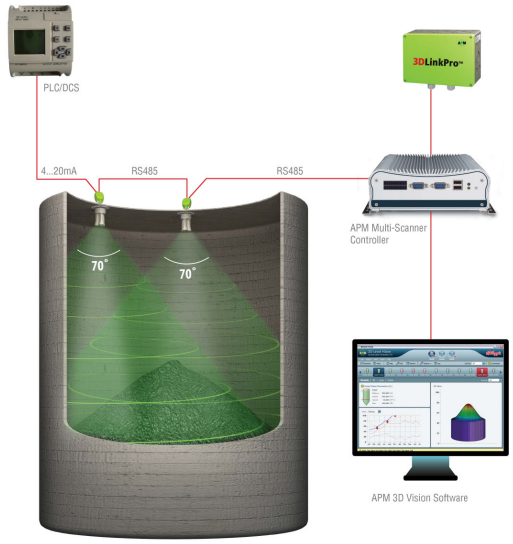


Figure 2 LAN Configuration Example Diagram

The system follows a client-server orientation. The APM Multi Scanner Controller application runs on a PC which is connected to all the scanners in the system. The client application can either run on the Controller, or on a remote PC connected to the Multi Scanner Controller via a network.

The APM Multi Scanner Controller is connected to the LAN / WAN and can be accessed using its unique IP address.

In general there are two types of remote network connections to the Multi Scanner Controller from any remote Client:

- Access from a local network – LAN.
- Access from the public network worldwide – WAN (pending IT authorization).

When accessing the Multi Scanner Controller from the local network, use its configured local IP address (e.g., 192.168.2.100) and IP Port: 22222.

When accessing the Multi Scanner Controller with a client PC outside the network (WAN / Internet) then the plant's router must forward communication from IP Ports 22221 and 22222 to the local IP address of the Multi Scanner Controller (e.g., 192.168.2.100). This is known is port forwarding.

Examples (refer to Figure 3):

1) If a user operating a local client PC within the local network (LAN) wishes to connect to the Multi Scanner Controller, the user must connect to IP address 192.168.2.100 and IP port 22222. All 3 PCs in the example can connect to the Multi Scanner Controller in parallel.

2) If a user operating a remote client PC via the Internet (WAN) wishes to connect to the Multi Scanner Controller, the user must connect to IP address 212.235.113.27 and to IP port 22222. The router must be configured to forward communications from IP Port 22221 and 22222 to the local IP address 192.168.2.100.

Every user in the system with an adequate permission level (Viewer or above) operating either a local or remote client PC can change the controller's parameters and configuration. These changes apply for all clients.

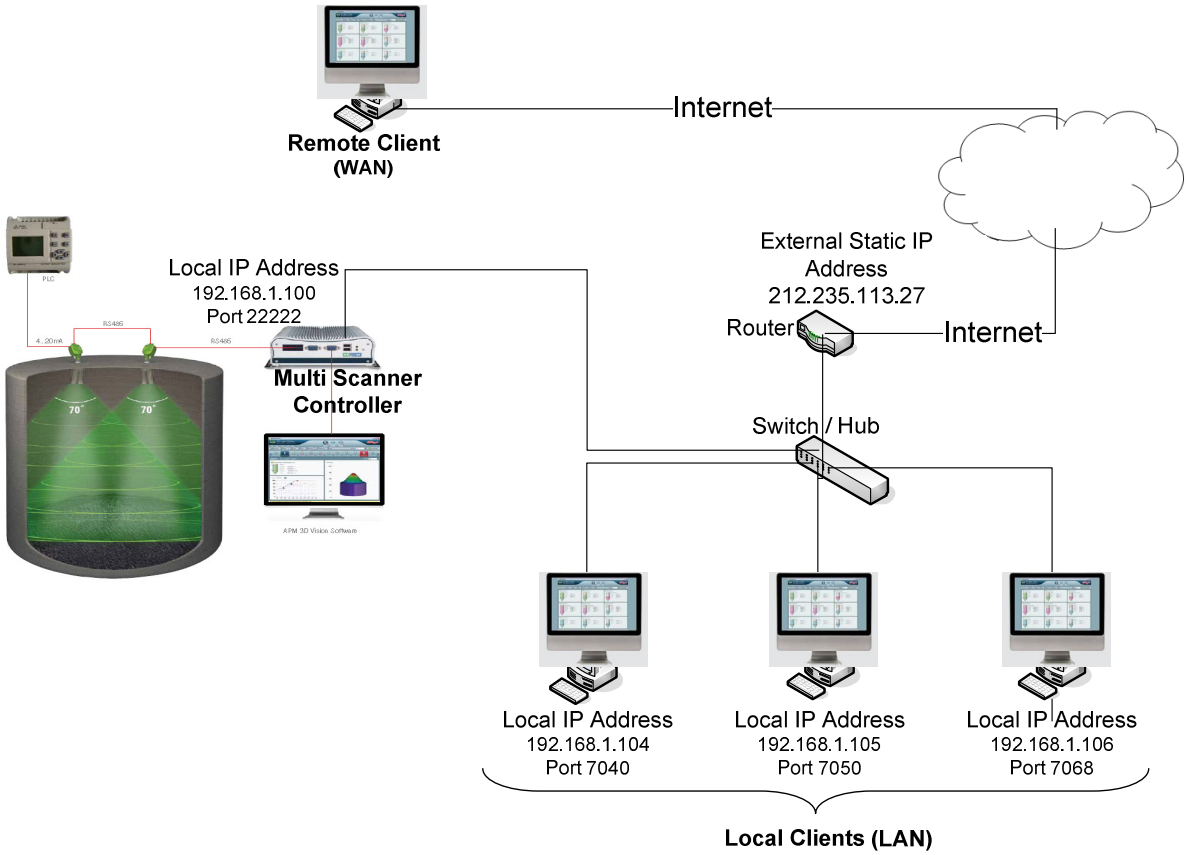


Figure 3 WAN Configuration Example Diagram

System Requirements (for Client side only)

The following are the system requirements:

- **Hardware:**
  - Required space on HD: 12 MB (for APM application only)
  - Log file: 2.8 MB / day
  - CDROM drive or USB port
  - At least 1 serial port (built in RS232 / USB)
- **Processor:** Pentium 1GHz
- **Memory:**
  - minimum 64 MB RAM

- Hard disk: Minimum 1 GB free memory on HD per year if Log file is enabled

- **Graphic resolution:** Minimum 1024X768
- **Interfaces:** RS232, USB (depending on configuration)
- **Operating system:** Windows XP, Microsoft® .NET framework 3.5, SP1

Workflow

For instructions on how to connect to the 3DLevelScanner in various ways, see the *Different Ways of Connecting to 3DLevelScanner* document.

1. Install the 3D Vision application in the Client PC. Refer to *Installing the Software* on page 9.
2. Run and configure the 3D Vision application on the intended Multi Scanner Controller. Refer to *System Configuration* on page 15.

2

Installing the Software

After gathering the recommended perquisite information, you can install the 3D Vision application.

Prerequisite Information

It is recommended to gather the following information relating to the connection of each 3DLevelScanner prior to installing the software and making the connections.

- Multi Scanner Controller Communication port number (Serial COM port) of the bus to which the 3DLevelScanners are connected.
- Multi Scanner Controller Communication IP Address and IP Port.
- 3D LinkPro Static IP Address for remote wireless commutation
- Polling address of each 3DLevelScanner [00 – 63]
- Product information – Density (for accurate weight measurement) and the product name.

For more information on how to connect to the 3DLevelScanner in various ways, see the document *Different Ways of Connecting to 3DLevelScanner*.

For more information about performing the hardware configuration, see the document *Multiple Scanners Operating Instructions*.

Installation

If you are using the APM Multi Scanner Controller PC system, the 3D Vision application is already installed on that controller. Skip to *System Configuration* on page 15.

To install the software:

1. Insert the APM software CD into the computer.

2. The installation application should run automatically. If it does not, browse the CD contents and manually run the file *APM 3DLevelVisionSetup.msi*. The 3D Vision setup wizard opens (Figure 4).

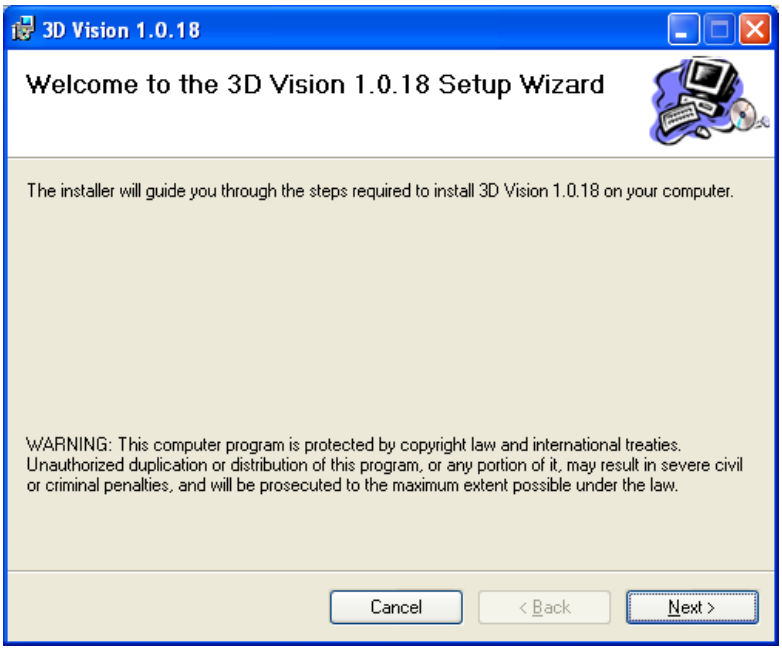

3D Vision 1.0.18
Welcome to the 3D Vision 1.0.18 Setup Wizard
The installer will guide you through the steps required to install 3D Vision 1.0.18 on your computer.
WARNING: This computer program is protected by copyright law and international treaties. Unauthorized duplication or distribution of this program, or any portion of it, may result in severe civil or criminal penalties, and will be prosecuted to the maximum extent possible under the law.
Cancel
< Back
Next >

Figure 4 3D Vision Setup Wizard

3. Click *Next*.

   If the PC on which you are installing APM 3D Vision does not have Microsoft® .NET framework 3.5, SP1 installed, the 3D Vision setup wizard automatically detects this and prompts you to install the framework at this stage.

   The 3D Vision setup wizard proceeds to the *Select Installation Folder* screen (Figure 5).

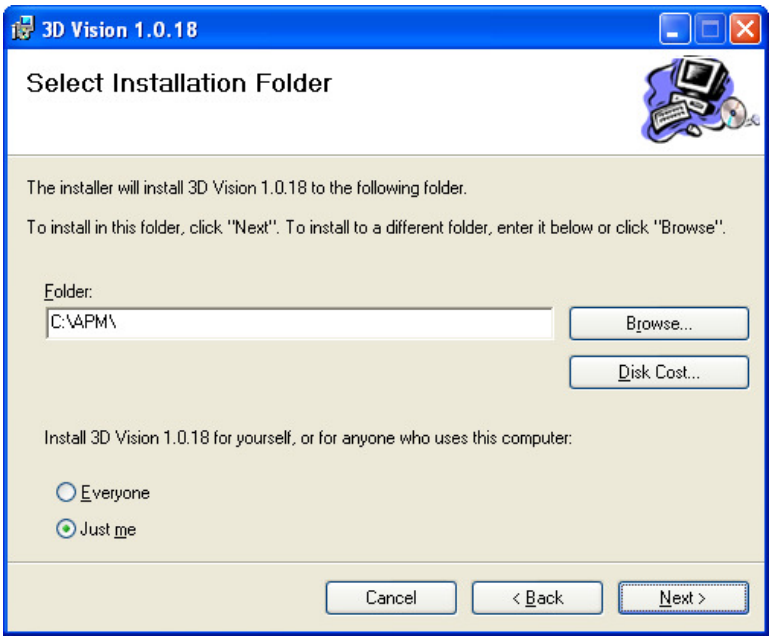

3D Vision 1.0.18
Select Installation Folder
The installer will install 3D Vision 1.0.18 to the following folder.
To install in this folder, click "Next". To install to a different folder, enter it below or click "Browse".
Folder:
C:\APM\
Browse...
Disk Cost...
Install 3D Vision 1.0.18 for yourself, or for anyone who uses this computer:
Everyone
Just me
Cancel
< Back
Next >

Figure 5 3D Vision Setup Wizard – Select Installation Folder Screen

4. If the computer on which the software is being installed has multiple user accounts, select one of the following:
   - *Everyone* to make the software available to all the computer users.
   - *Just me* to make the software available to the present user account only.
5. Click *Next*. The *Confirm Installation* screen appears.

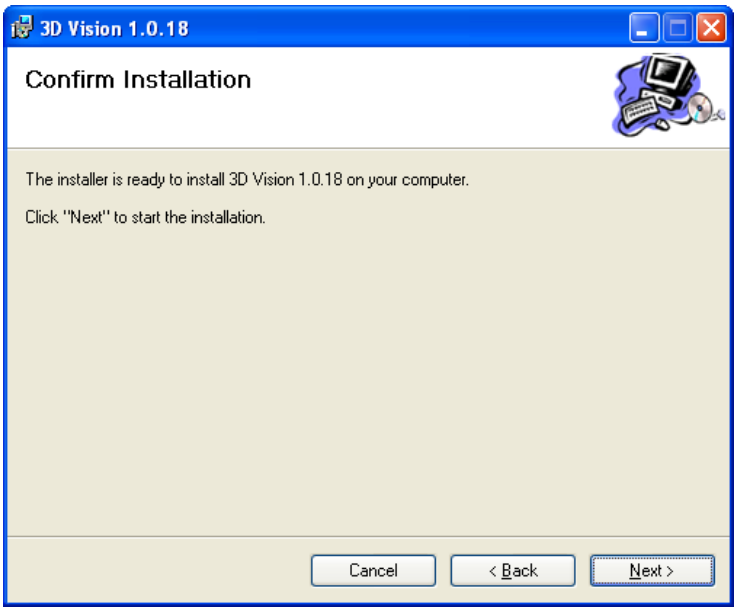

3D Vision 1.0.18
Confirm Installation
The installer is ready to install 3D Vision 1.0.18 on your computer.
Click "Next" to start the installation.
Cancel
< Back
Next >

Figure 6 3D Vision Setup Wizard – Confirm Installation Screen

6. Click *Next* to confirm the installation (Figure 6). The APM software is installed (Figure 7).

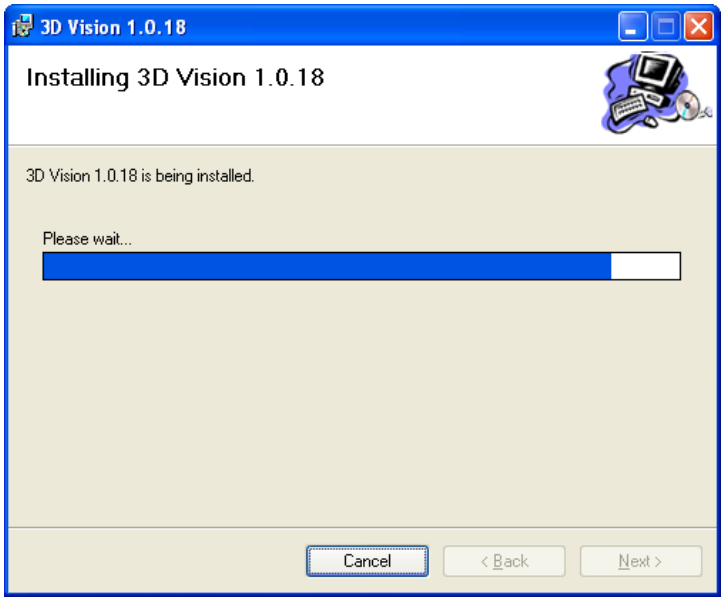


Figure 7 3D Vision Setup Wizard – Installing 3D Vision Setup Screen

After all the necessary files are loaded and installed, the *Installation Complete* screen appears, notifying that the APM software installation was completed successfully (Figure 8).

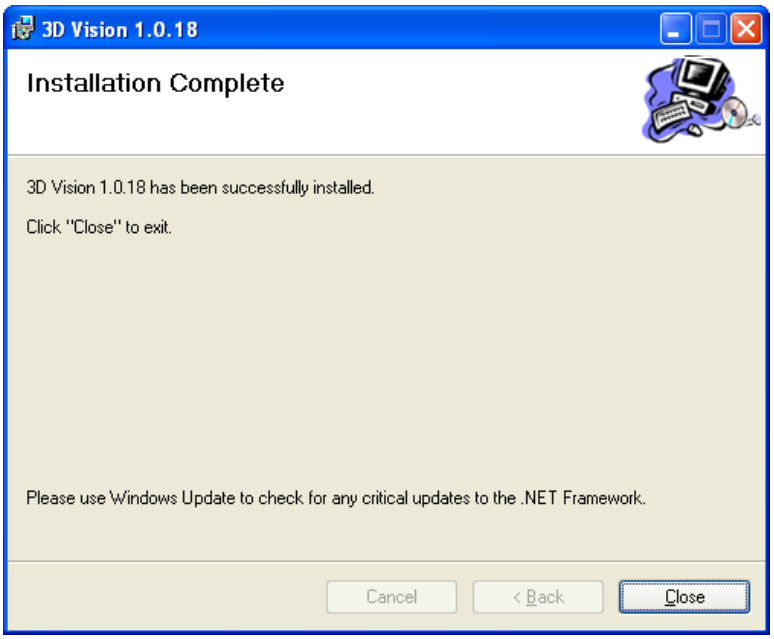

3D Vision 1.0.18
Installation Complete
3D Vision 1.0.18 has been successfully installed.
Click "Close" to exit.
Please use Windows Update to check for any critical updates to the .NET Framework.
Cancel
< Back
Close

Figure 8 3D Vision Setup Wizard – Installation Complete Screen

7. Click **Close** to finish the installation of the APM Software. The installer places the following shortcut icon on your desktop.

Figure 9 APM 3D Vision Shortcut Icon

3

System Configuration

The process of configuring the system includes connecting to the Multi Scanner Controller and starting a new project.

Connecting to the Multi Scanner Controller

To connect to the Multi Scanner Controller from the 3D Vision application:

1. Double-click the *APM 3D Vision* shortcut on your desktop.

   Or

   Click *Start* | *Programs* | *APM* | *APM 3D Vision*.

   The 3D Vision application opens and displays the *Controller Connection* window (Figure 10).

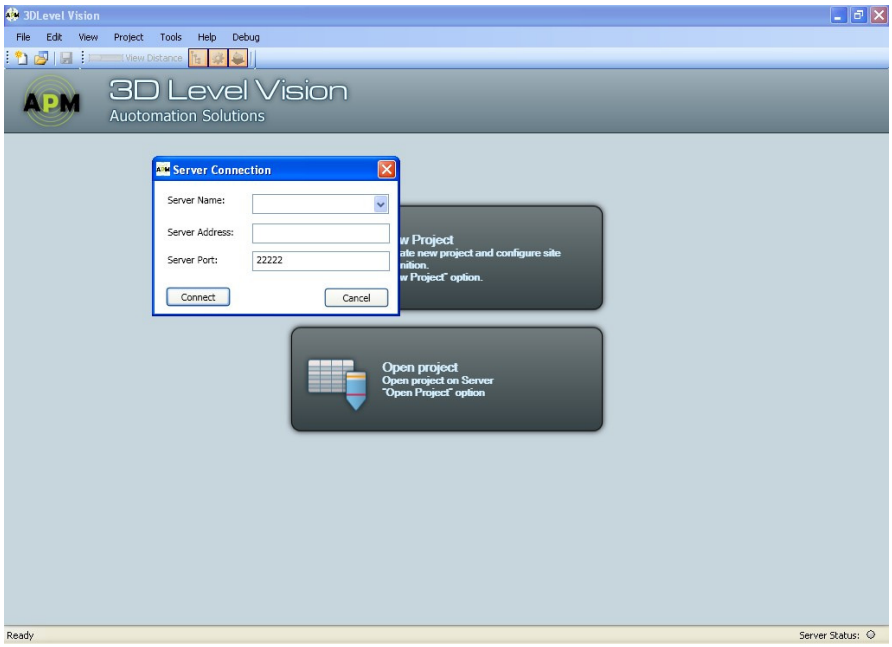


Figure 10 3D Level Application Opening Screen with Controller Connection Window

2. In the *Server Address* field, enter the IP address of the Multi Scanner Controller:
   - If you are running the client on the Multi Scanner Controller PC, enter the local IP address for the Multi Scanner Controller on your network.
   - If you are running the client on a remote PC, enter the global IP address for the Multi Scanner Controller.
3. In the *Controller Port* field, verify that the entered server port is 22222.
4. Click *Connect*. The application connects to the Multi Scanner Controller and you are prompted to enter your username and password (Figure 11).

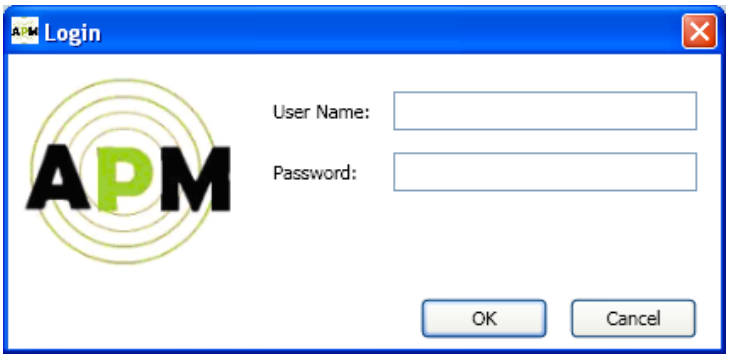


Figure 11 APM Vision Login Window

5. Enter a username and password. The default username and password are both "admin" (case sensitive).

It is important to define the usernames, passwords, and permission levels of the various user accounts prior to setting up projects in the system. Refer to User Management on page 54. At least one user account must have the administrator permission level.

Starting a New Project

After logging in to the Multi Scanner Controller, you are prompted to start a new project or open an existing project (Figure 12).

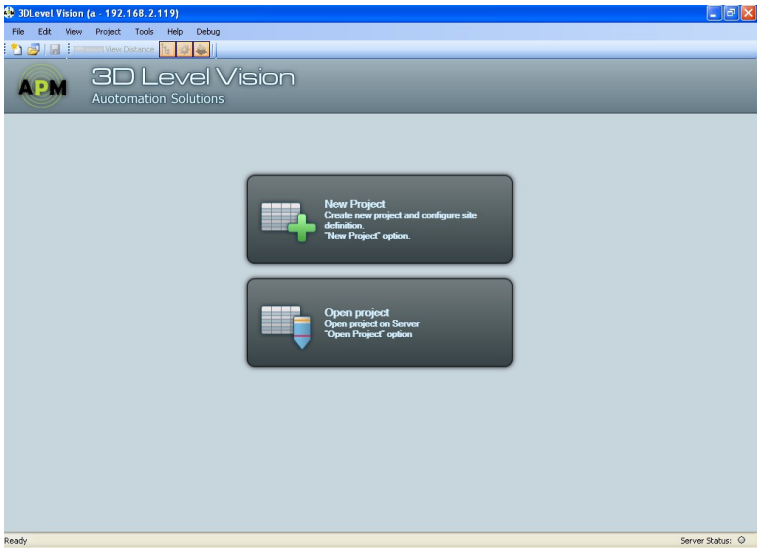


Figure 12 New Project Button

For information on navigating the panes and menus mentioned in the section, refer to *Chapter 4: Using the APM 3D Vision or* 3D MultiVision Panes on page 21 and *Appendix A: Software Menus* on page 43 as necessary.

To start a new project:

1. Click *New Project* to create a new project. The *Project Details* window appears (Figure 13).

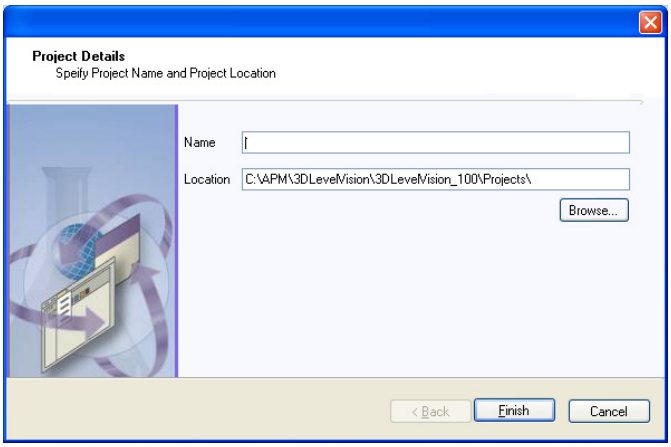


Figure 13 Project Details Window

2. In the *Name* field, enter a name for the project.
3. Optionally, in the *Location* field, change the defined location for the project files by editing the path, or browsing for a new location.
4. Click *Finish*. The new project is created.

5. Define the connection settings for a 3DLevelScanner as follows:

   a. In the project pane on the left side of the screen, select *Site* | *Vessel* | *<unknown1> (device tag of the 3DLevelScanner)* | *Connection*. The connection options for the selected scanner appear (Figure 14).

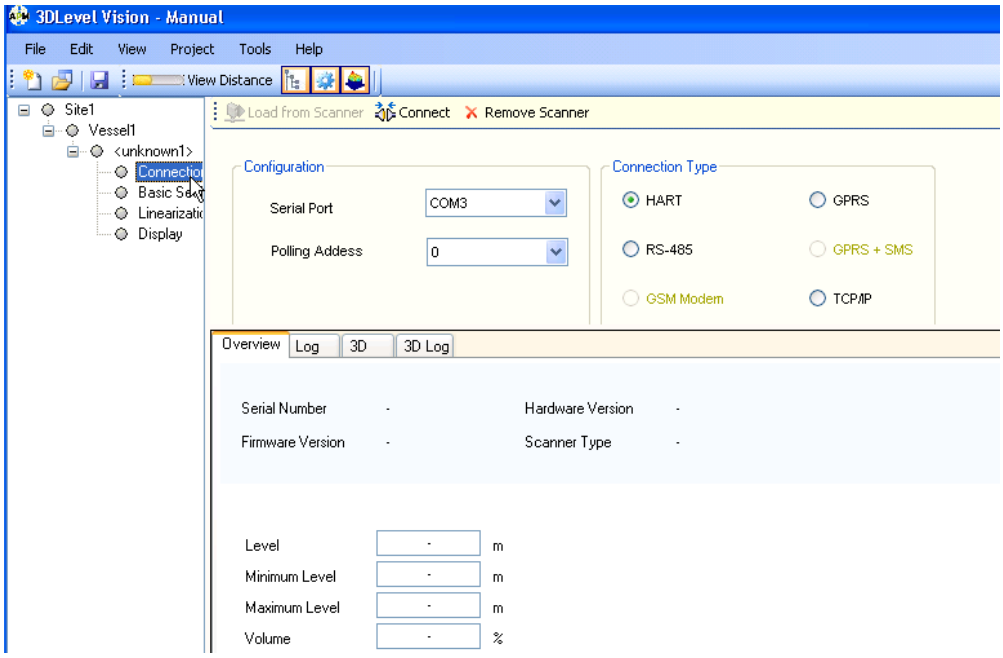


Figure 14 Scanner Configuration Options

   b. In the *Serial Port* field, select a serial COM port

   c. In the *Polling Address* field, select the scanner's polling address

   d. In the *Connection Type* area, select the scanner's connection type.

   e. Click Connect.

6. To add more scanners to the project, repeat step 5 for each scanner.

7. Optionally, perform the following for each site:

   a. In the project pane, select a site. The configuration options for the site appear (Figure 15).

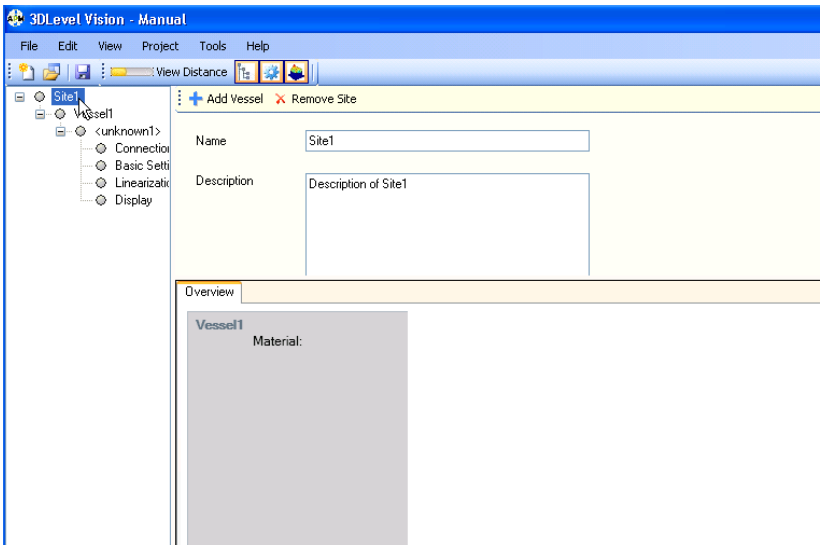


Figure 15 Site Configuration Options

b. In the *Name* field, enter a name for the site.

c. In the *Description* field, enter a description for the site, for example its location or the number of vessels it contains.

8. Perform the following for each vessel:

a. In the project pane, select a vessel. The configuration options for the vessel appear (Figure 16).

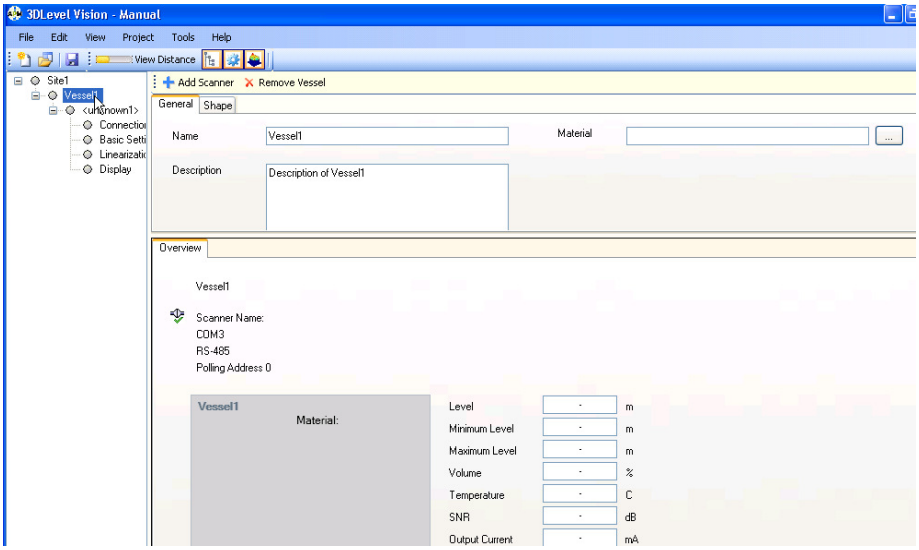


Figure 16 Vessel Configuration Options

b. In the *Name* field, enter a name for the vessel.

c. In the *Description* field, enter a description for the vessel, for example its location in the plant.

d. In the *Material* field, browse to select the material contained in the vessel. For information on defining the list of available materials, refer to *Material Color* on page 53.

9. Click

   Or

   Click *File* | *Save*.

   The project is saved.

10. Click and to hide the project and configuration panes respectively. The viewing pane is displayed, enabling you to monitor of the sites, vessels, and sensors.

4

Using the APM 3D Vision or 3D MultiVision Panes

There are 3 main areas in the 3D Vision application (Figure 17).

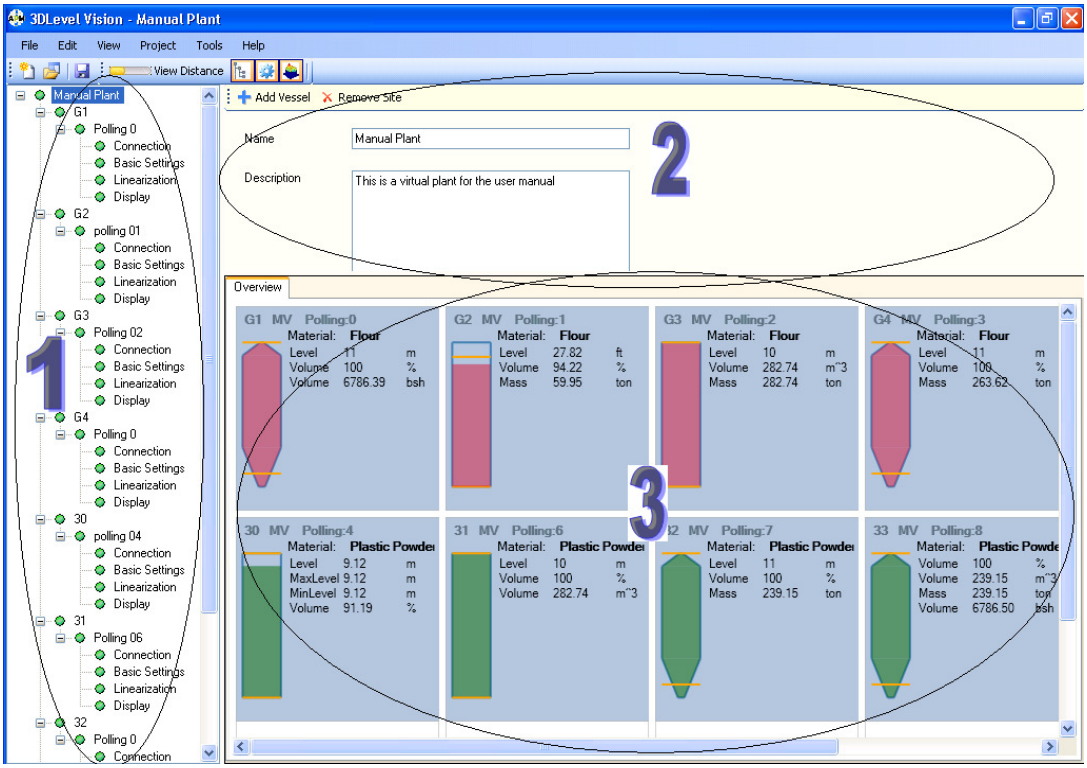


Figure 17 Main Panes

1. Project Pane – Enables you to navigate between sites, vessels, and scanners in a project.
2. Configuration Pane – Enables you to configure site, vessel, and scanner details.
3. Viewing Pane – Enables you to view each vessel with its measurements (volume, distance, mass, etc.).

You can toggle the display of these panes by clicking their respective icons:

- – Project Pane.
- – Configuration Pane.
- –Viewing Pane.

Alternatively, open the *View* menu and click the name of the panes to show or hide the panes.

Project Pane

The project pane displays a navigation tree which represents all of the 3DLevelScanners in a project.

Each project is organized in a hierarchical structure as follows. The project is at the top of the hierarchy. Under the project is a list of sites. Under each site is the list of vessels located at the site. Under each vessel is the list of scanners associated with the vessel. For example, in a single project there could be multiple sites (or multiple groups of vessels), in each site or group there could be multiple vessels, and in each vessel there might be one scanner.

In the example in Figure 17, there is a single site called *Manual Plant*. The site has eight vessels (G1, G2, G3, G4, 30, 31, 32, 33) and in each vessel there is a single 3DLevelScanner (labeled *polling x*).

Each 3DLevelScanner has its configuration (Connection, Basic Settings, Linearization, and Display), which can be viewed in the configuration pane.

Configuration Pane

The Configuration Pane enables you to view the configuration details for the various sites, vessels, and scanners in a project.

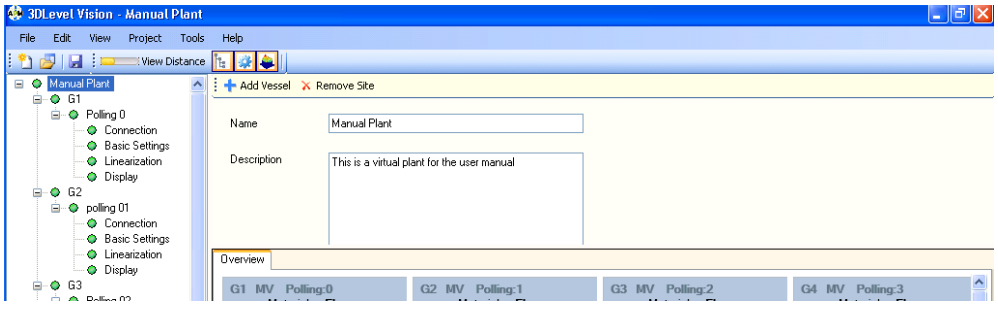


Figure 18 Configuration Pane – Site Example

The configuration pane also enables you to add and remove sites, vessels, and scanners from the project.

- While viewing the configuration options for a site, click Add Vessel to add a vessel.

  Or

  While viewing the configuration options for a site, from the menu bar select *Edit* | *Add* | *Vessel*.

- While viewing the configuration options for a site, click Remove Site to delete the selected site.

  Or

  While viewing the configuration options for a site, from the menu bar select *Edit* | *Delete* | *Site*.

- To add a site to the project, from the menu bar click *Edit* | *Add* | *Site*.

In the configuration pane, you can enter a site name and a site description. In the example of Figure 17, the site name is *Manual Plant* and the description is *This is a virtual plant for the user manual*.

Vessel Configuration

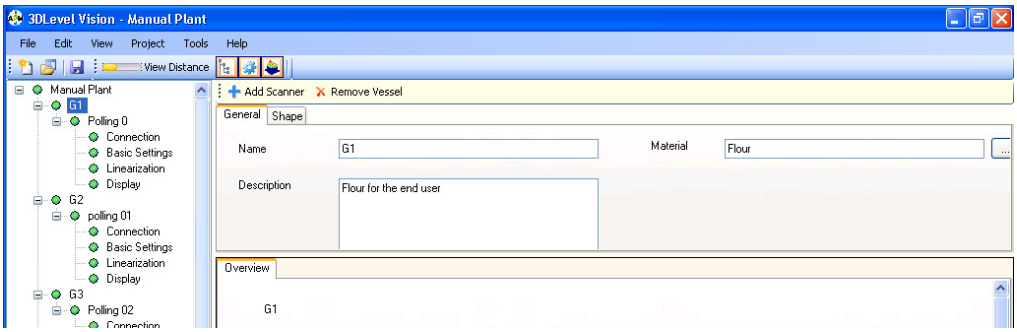


Figure 19 Configuration Pane – Vessel Example

- While viewing the configuration options for a vessel, click Add Scanner to add a scanner.

  Or

  While viewing the configuration options for a vessel, from the menu bar select *Edit* | *Add* | *Scanner*.

- While viewing the configuration options for a vessel, click Remove Vessel to delete the selected vessel.

  Or

  While viewing the configuration options for a vessel, from the menu bar select *Edit* | *Delete* | *Vessel*.

In the 3D Vision application, version 1.0.x, it is possible to view and control only a single vessel. For adding more vessels a software upgrade to 3D MultiVision is needed.

In the configuration pane, under the *General* tab, you can enter the vessel name, the vessel description, and you can either browse to select the material which the vessel contains, or from the menu bar select *Tools | Material Color*.

In the example of Figure 17, the vessel name is set to *G1*, the description is *Flour for the end user*, and the Material is *Flour*.

- Under the *Shape* tab (Figure 20), the vessel geometry can be viewed.

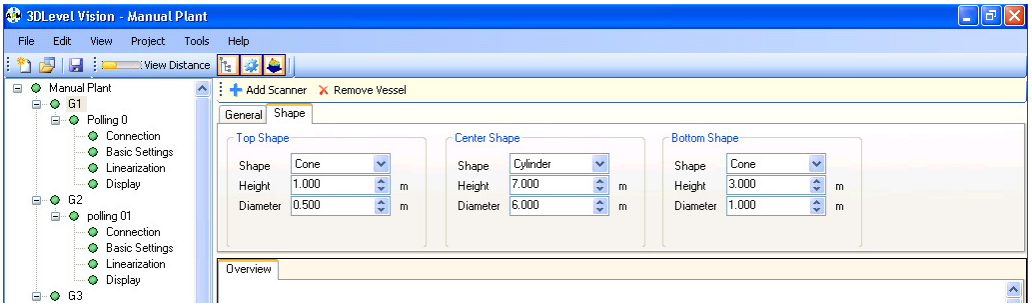


Figure 20 Configuration Pane – Vessel Example – Shape Tab

In the 3D Vision application, version 1.0.x, the vessel shape parameters can only be viewed. To change the parameters, you must use the 3DLevel Manager Software Tool.

3DLevelScanner Configurations

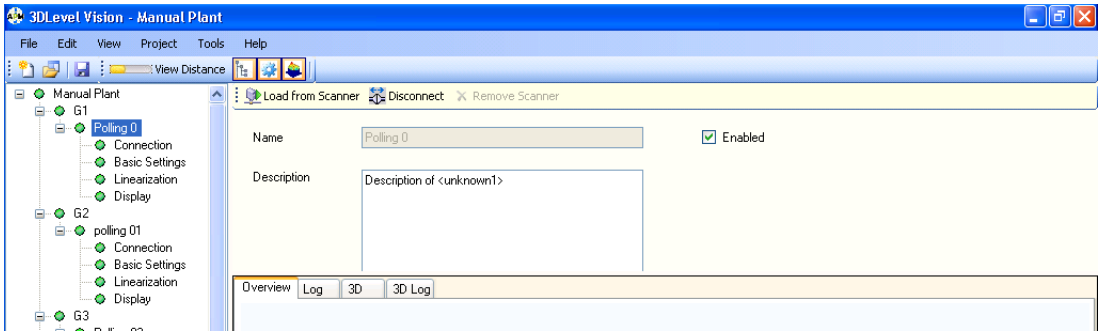


Figure 21 Configuration Pane – Scanner Example

The following 3DLevelScaner tasks can only be performed from the configuration pane while a 3DLevel Scanner is selected in the project pane. In the example above, *Polling 0* is the selected scanner.

- Optionally, enter a description for the 3DLevelScanner.

- Select the *Enable* checkbox to enable the scanner. When the scanner is enabled, the measurements are automatically downloaded from the 3DLevelScanner to the 3D Vision application. In the project panel, the connection color is green.
- Unselect the *Enable* checkbox to disable the scanner. When the scanner is disabled, the measurements are not automatically downloaded from the 3DLevelScanner. In the viewing pane, the scanner is not monitored, and in the project pane the connection color is yellow.

  In the example below, scanner *Polling 0* in vessel *G1* is disabled.

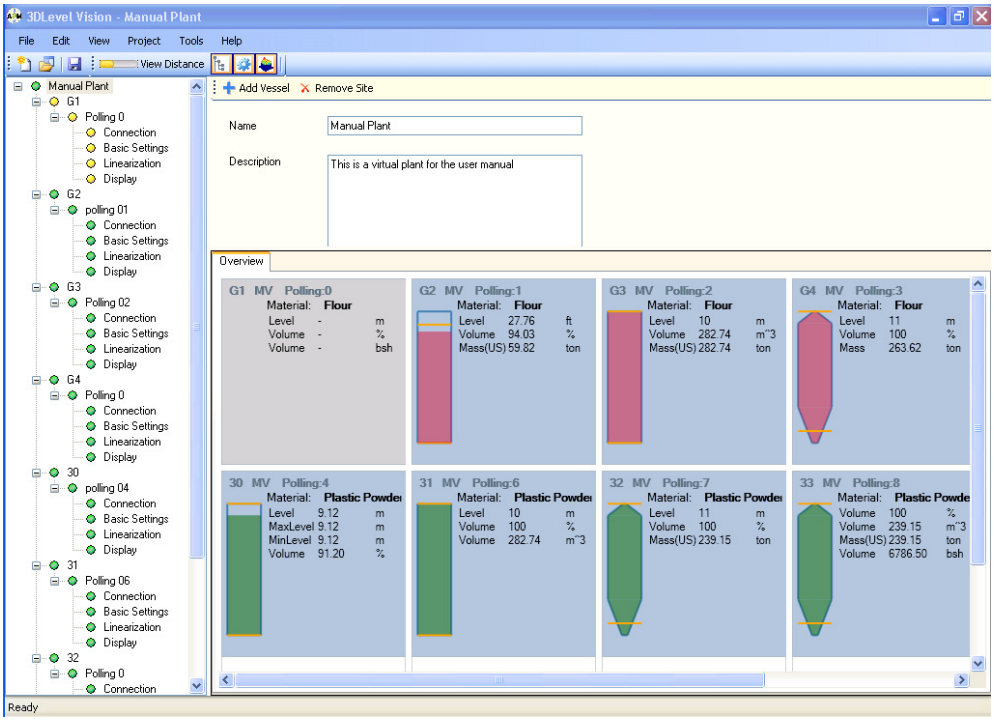


Figure 22 Disabled Scanner Example

- Optionally, click Load from Scanner to manually download all measurements from the selected 3DLevelScanner to the 3D Vision application.
- Optionally, click Disconnect to close the connection between the selected 3DLevelScanner and the 3D Vision application.

Connection Settings

You must define the connection settings for each 3DLevelScanner in the project.

For each 3DLevelScanner, select *Connection* in the program pane and define the following:

- Configuration details:
  - Serial PC Port.
  - Polling Address.
- Connection Type:
  - HART.
  - RS485.
  - GPRS.
  - GPRS+SMS.
  - TCP/IP.

For GPRS, GPRS+SMS and TCP/IP, additional configuration is needed. After selecting one of these options, the *Additional Configuration* area is displayed on the right side of the configuration pane.

In the example below, the connection to 3DLevelScanner <*unknown 1*>, in vessel *G1*, in site *Manual Plant* is set to polling address *0* and a *TCP/IP* type connection. The Multi Scanner Controller IP address and Multi Scanner Controller IP port are also defined in the *Additional Configuration* area that appeared for the TCP/IP connection type.

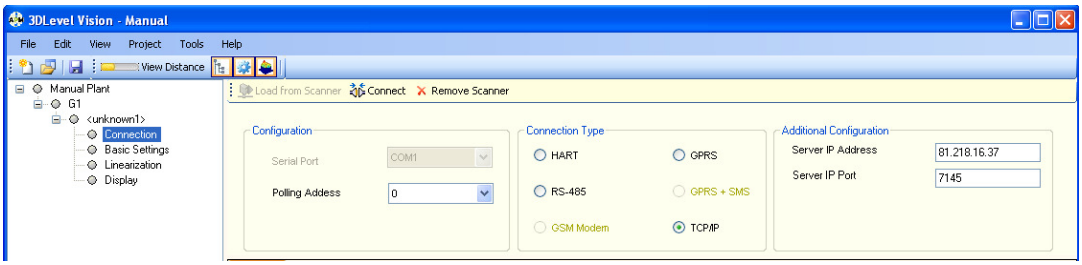


Figure 23 Configuration Pane – Scanner Connection Options

For a more detailed explanation of how to connect to a 3DLevelScanner in various ways, refer to the document *Different Ways of Connecting to 3DLevelScanner*.

Basic Settings

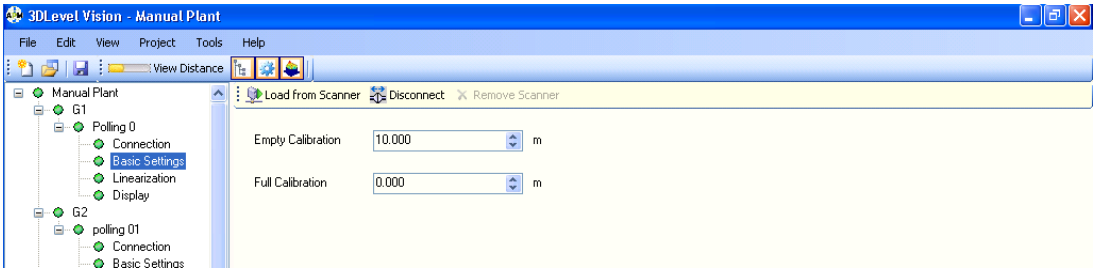


Figure 24 Configuration Pane – Scanner Basic Settings Options

In the program pane, under the selected scanner, select *Basic Settings* to view the following:

- Empty Calibration.
- Full Calibration.

In the example above, the basic settings for Scanner *Polling 0*, in vessel *G1*, in site *Manual Plant* are 10 and 0 meters for the Empty and Full Calibrations respectively.

In the 3D Vision application, version 1.0.x, the Basic Settings parameters can only be viewed. To change the parameters, you must use the 3DLevel Manager Software Tool.

Linearization Settings

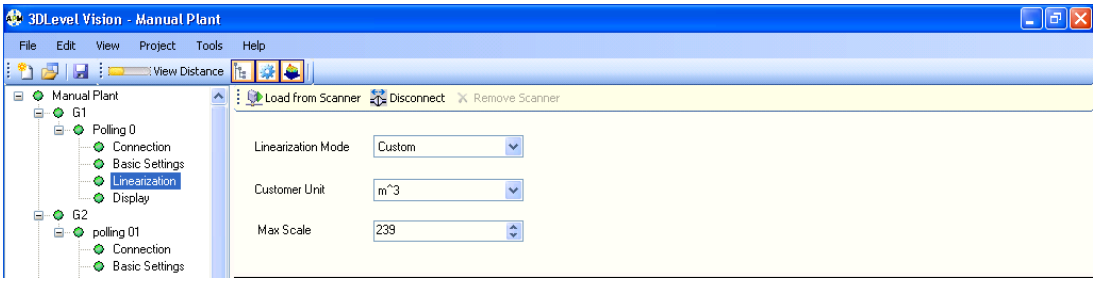


Figure 25 Configuration Pane – Scanner Linearization Options

In the program pane, under the selected scanner, select *Linearization* to view the following:

- Linearization Mode.
- Customer Unit.
- Max Scale.

In the example above, the Linearization settings of Scanner *Polling 0*, in vessel *G1*, in site *Manual Plant*, are Custom mode, customer unit m^3, and the maximum scale of the vessel is 239 m^3.

In the 3D Vision application, version 1.0.x, the linearization parameters can only be viewed. To change the parameters, you must use the 3DLevel Manager Software Tool.

Display Settings

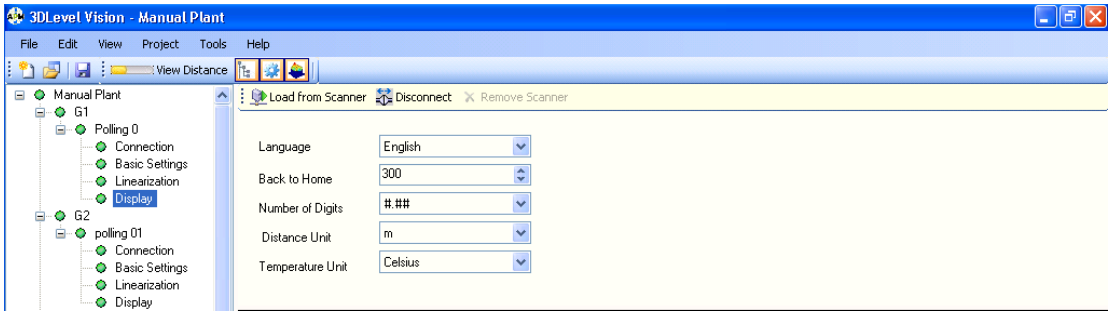


Figure 26 Configuration Pane – Scanner Display Options

In the program pane, under the selected scanner, select *Display* to view the following:

- Language.
- Back to Home – Time to automatically go to default screen in the scanner's LCD.
- Number of Digits – Number of digits after the decimal point when displaying measurements.
- Distance Unit – Unit of measurement used for distances.
- Temperature Unit – Unit of measurement used for temperatures.

In the example above, the Display settings of Scanner *Polling 0*, in vessel *G1*, in site *Manual Plant* are *English* language, Back to Home of *300* seconds, 2 digits after the decimal point in the measurements, the Distance Unit is *meters*, and the Temperature Unit is *Celsius*.

In the 3D Vision application, version 1.0.x, the display parameters can only be viewed. To change the parameters, you must use the 3DLevel Manager Software Tool.

Viewing Pane

The viewing pane has three viewing levels:

- Site Level.
- Vessel Level.
- Scanner Level.

Site Level

After making all configurations using the project and configuration panes, close the project and configuration panes to view the site level viewing pane.

The site level viewing pane is the most commonly used pane in the 3D Vision and MultiVision applications.

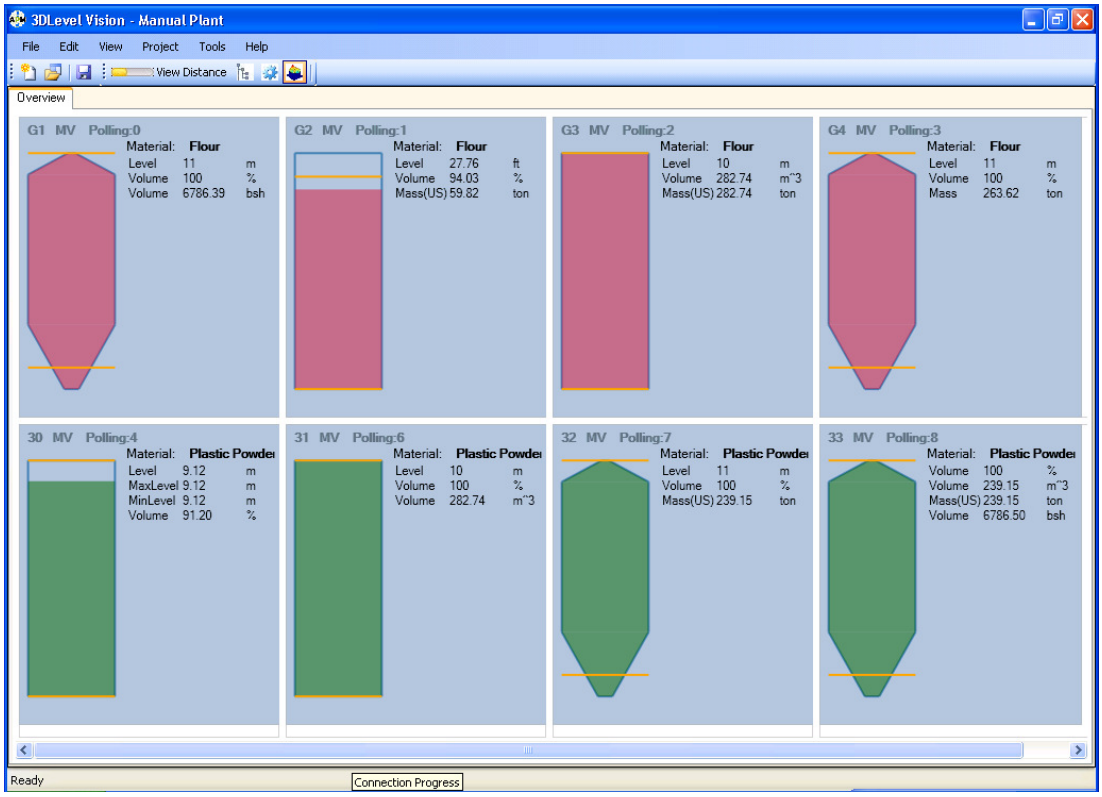


Figure 27 Viewing Pane –Site Level MultiVision Example

- Double-click a vessel image to open a 3D Profile for that vessel.

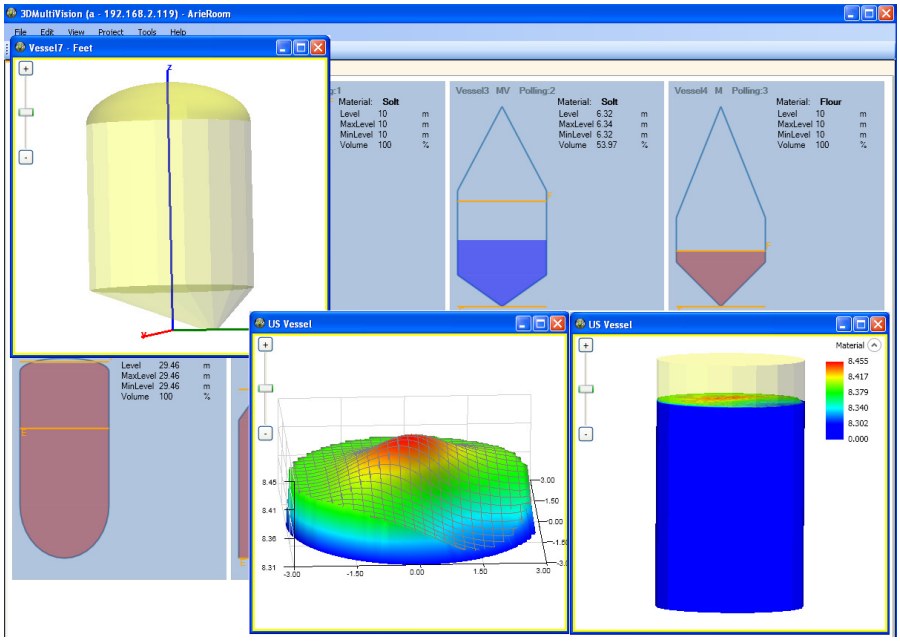


Figure 28 3D Vessel Profile – Site Level

Notes:

- A 3D Profile is enabled only for MV/MVL scanner types.
- Parallel 3D Profiles can be viewed. In the example above, two images are viewed in parallel.

Vessel Level

To view the measurements for a vessel:

- In the project pane, click a vessel name. The vessel information is displayed.

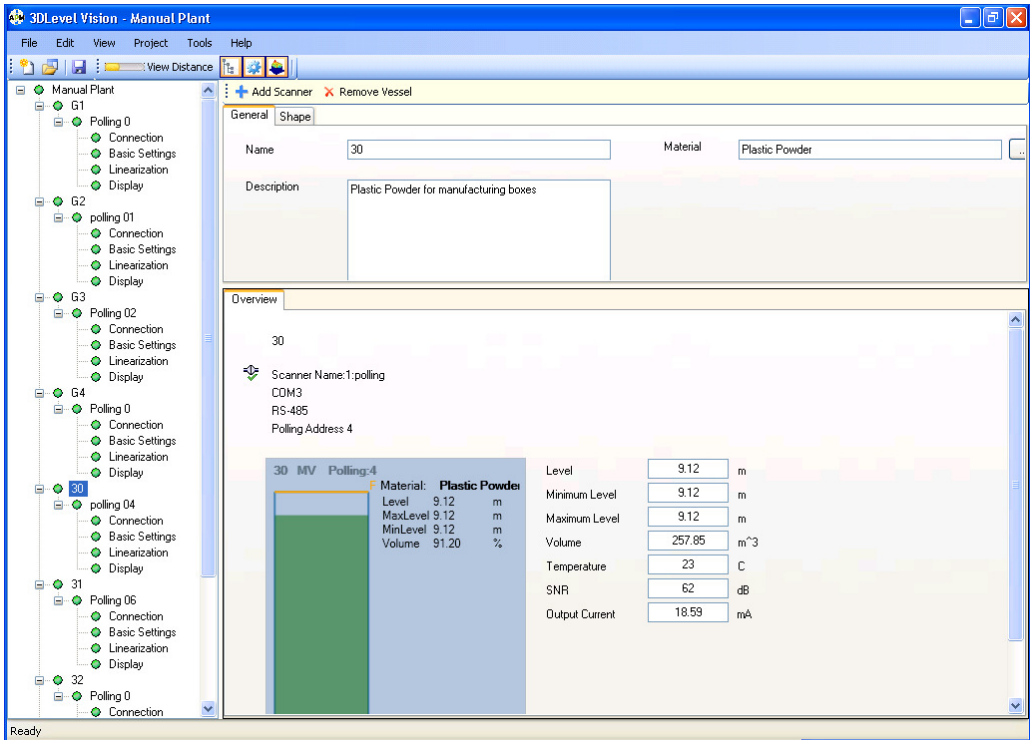


Figure 29 Viewing Pane –Vessel Level Example

In the example above, vessel *30* is selected, and all measurements for that vessel (Level/Distance, Volume, Temperature, SNR, 4-20mA Output, etc.) are displayed.

- Double-click the vessel image to open a 3D Profile for the vessel.

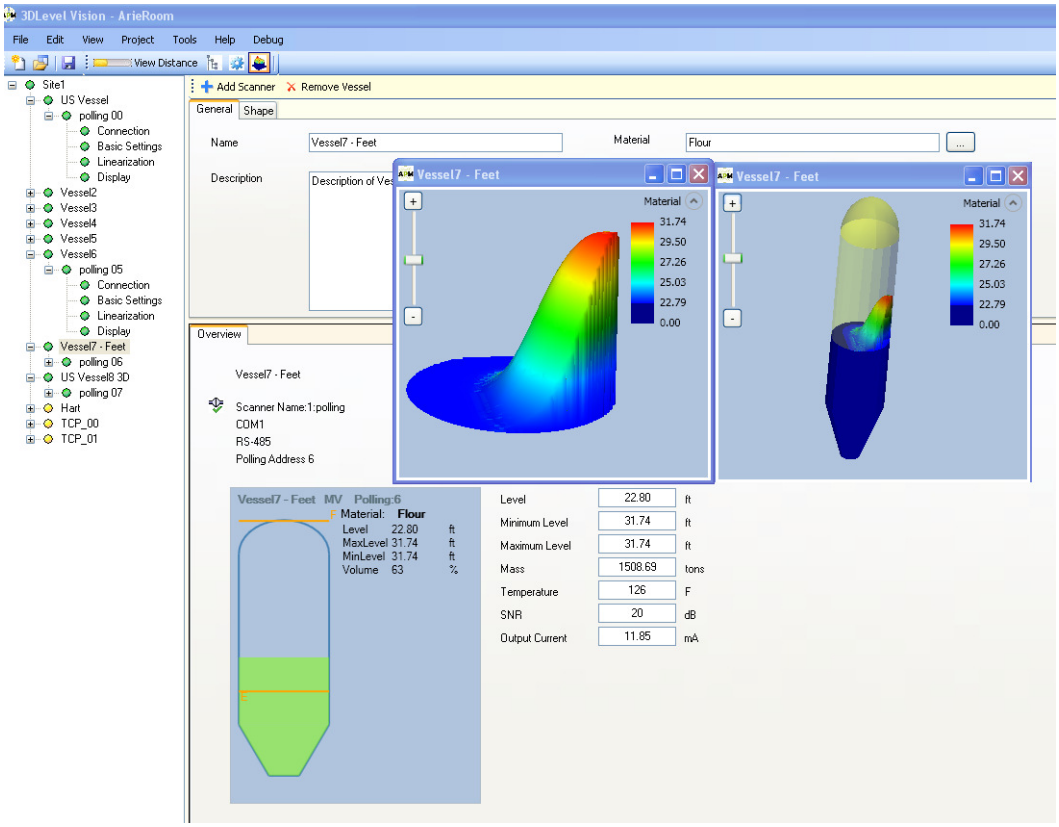


Figure 30 3D Vessel Profile – Vessel Level

Notes:

- A 3D Profile is enabled only for MV/MVL scanner types.
- Parallel 3D Profiles can be viewed. In the example above, two images are viewed in parallel.

The vessel level features the following tabs:

- Overview.
- Log.
- 3D.
- 3D Log.
- Advanced 3D (disabled in Viewer Mode).

Overview

The Overview tab displays the measurements of the vessel:

- Level/Distance.
- Volume.
- Temperature.
- SNR.
- 4-20mA Output.
- Alerts
- etc.

Under the scanner level the scanner's information is also displayed:

- Serial Number of the electronic card.
- Firmware Version.
- Hardware Version.
- Type of 3DLevelScanner.

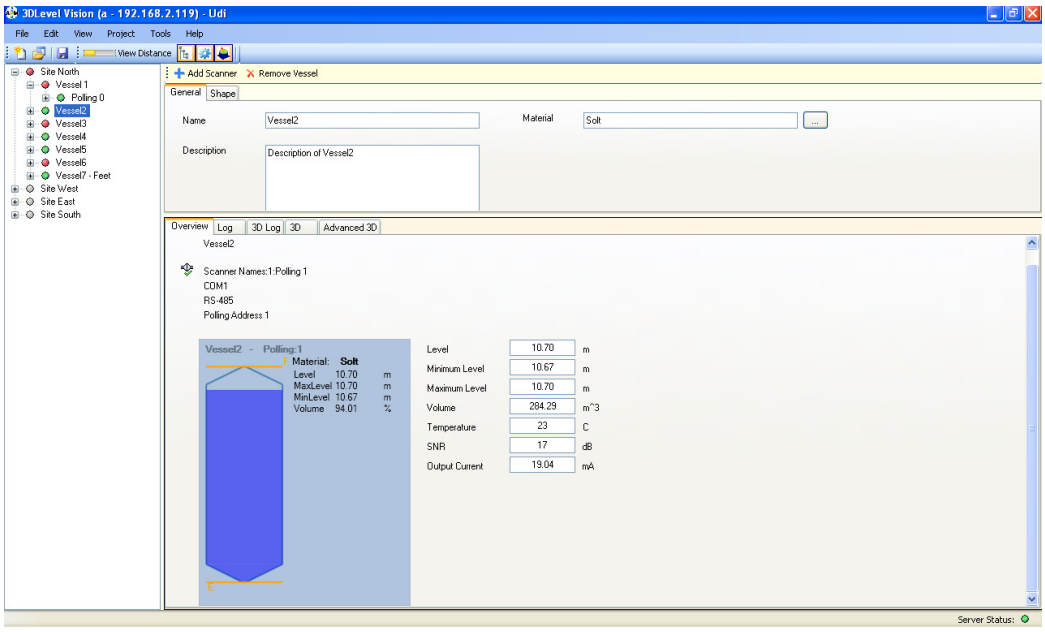


Figure 31 Viewing Pane – Vessel Level – Overview Tab

Alerts

The system provides alerts for configuration and system notifications.

- System Notifications – characterized in red color. When the temperature of a 3DLevelScanner reaches beyond the temperature region of the spec (hence, beyond -40 to +85 degrees Celsius or -40 to +185 degrees Fahrenheit)
- Configuration Notifications – characterized in yellow color. When MVL scanner's settings do not have the same vessel settings (all the configuration wizard settings except device position or horizontal angle). The output will be displayed above the vessel image in yellow font.

Parameters Definition

The system enables the user to choose which measured parameters will be displayed on screen. Use the right click on the vessel image to launch the *Parameters Definition* window (Figure 32).

Data Selection tab, drag the right pane parameters to the left pane for displaying the parameters. Use the up and down buttons to move parameters up and down respectively. For mass display, configure the product density in the bottom right corner.

Alerts tab, select the minimum and maximum volume levels for setting system output alarm. The alarm will be displayed as a red background in the vessel image.

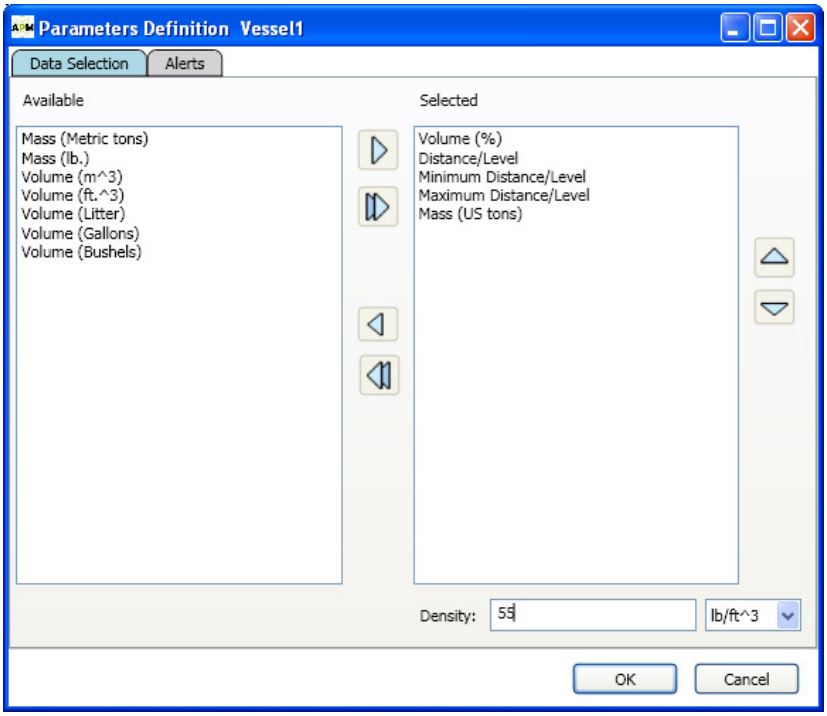


Figure 32 – Parameters Definition Window

Log

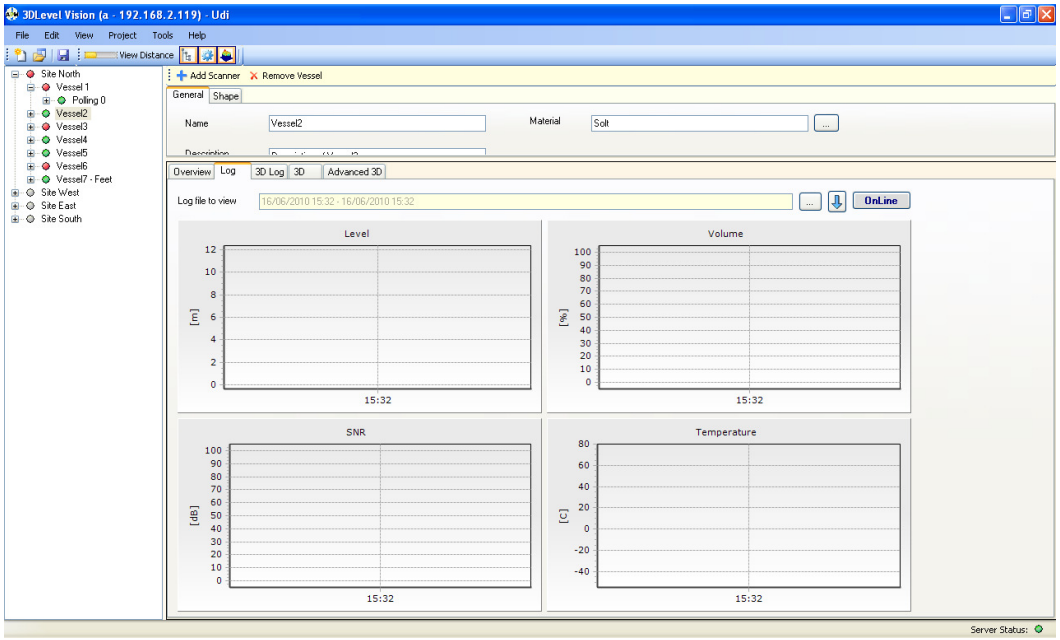


Figure 33 Viewing Pane – Vessel Level – Log Tab

The Log tab displays the following log information in 2D graphical format:

- Level / Distance.
- Volume.
- SNR.
- Temperature.

These logs are also displayed online. All log files are saved in the Multi Scanner Controller .

To automatically download previous log files:

1. Click *Offline* to exit online logging.
2. Click . The *Search Log* window appears (Figure 34).

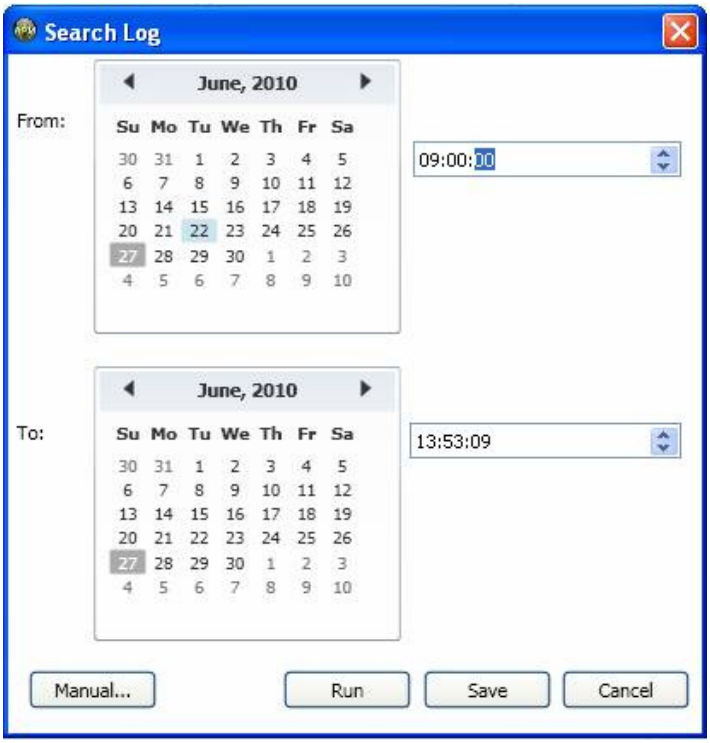


Figure 34 Search Log Window

3. Select the *From* and *To* dates and times to display.
4. Click *Run*. The log will automatically be displayed (identical to the *Run* function in the internet for automatic run of a downloaded file).
5. Click *Save*. You are prompted to save the selected logs to a location.

To manually download previous log files:

1. Click *Offline* to exit online logging.
2. Click . The *Search Log* window appears (Figure 34).
3. From the Search Log window, click *Manual*. The *Files* window appears displaying all the log files (Figure 35).

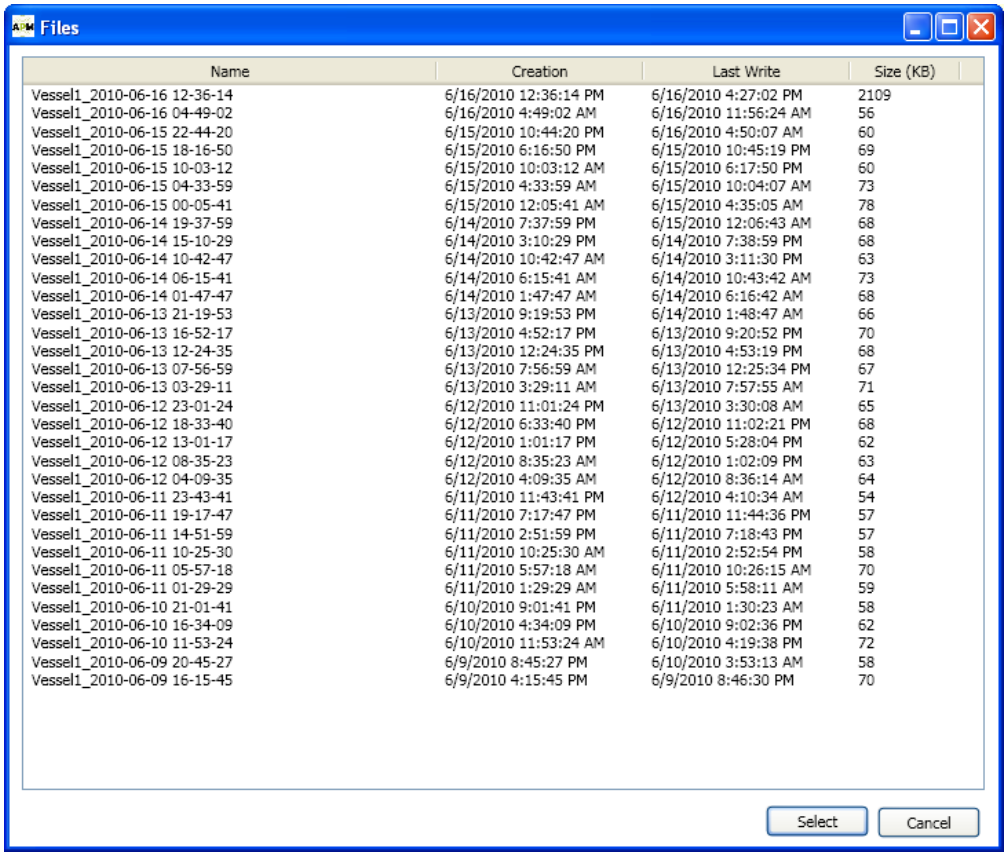


Figure 35 Files Window

4. Select one or more log files.
5. Click *Select*. You are prompted to save the selected logs to a location.

3D Log

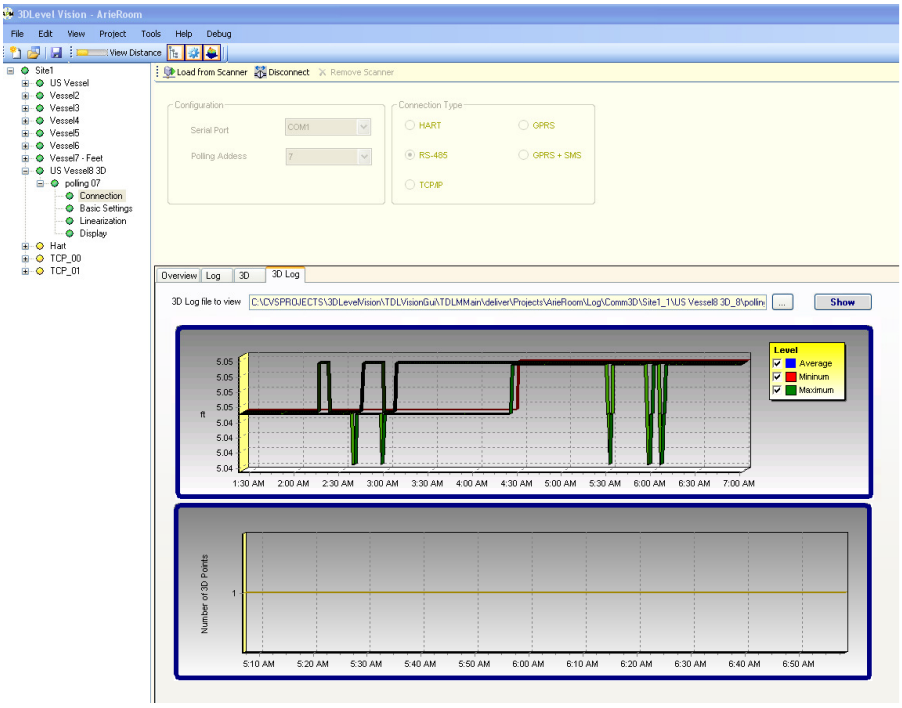


Figure 36 Viewing Pane – Vessel Level – 3D Log Tab

The 3D Log tab displays the minimum/maximum and average distance/level measurement values for the vessel.

The 3DLog is displayed online. All 3D Log files are saved to the Multi Scanner Controller .

To automatically download previous 3D log files:

1. Click *Offline* to exit online logging.
2. Click . The *Search Log* window appears (Figure 34).
3. Select the *From* and *To* times to display.
4. Click *Select*. You are prompted to save the selected logs to a location.

To manually download previous 3D log files:

1. Click *Offline* to exit online logging.
2. Click . The *Search Log* window appears (Figure 34).
3. From the Search Log window, click *Manual*. The *Files* window appears displaying all the log files (Figure 35).

4. Select one or more log files.
5. Click *Select*. You are prompted to save the selected logs to a location.

3D

The 3D tab displays the visual mapping contour as scanned by the 3DLevelScanners (enabled for MV type scanners only).

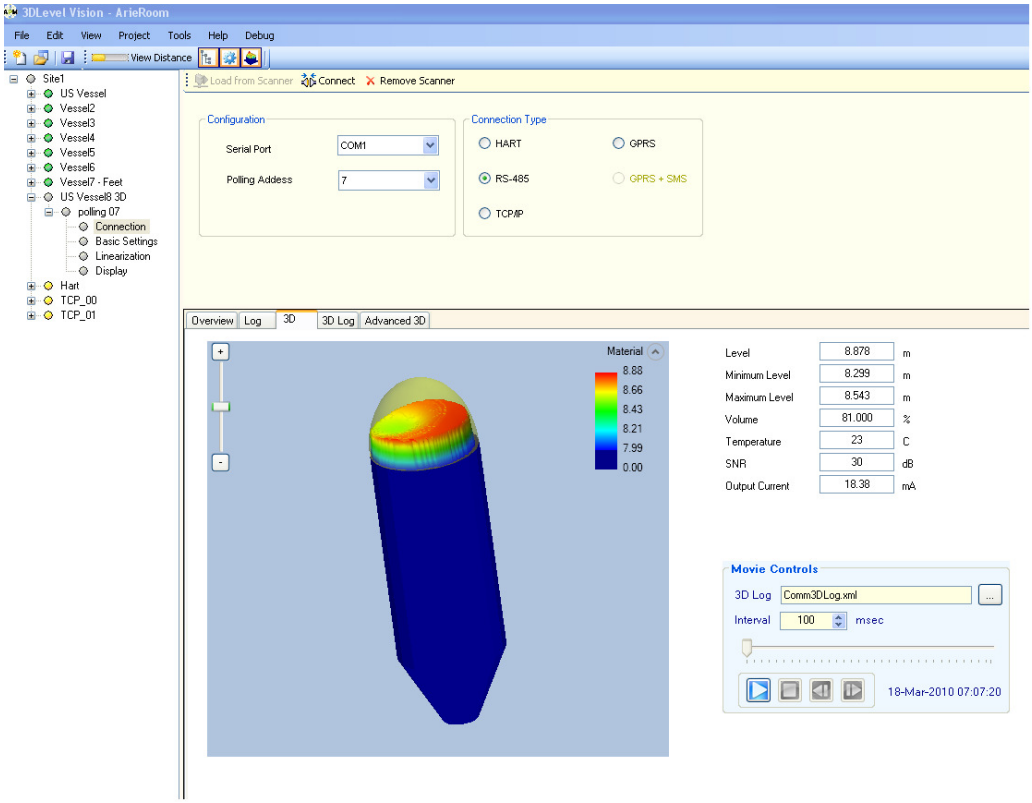


Figure 37 Viewing Pane – Vessel Level – 3D Tab

- To rotate the 3D image, left-click the 3D image and drag it.

For MV/MVL types of 3DLevelScanners, the application records 3D mapping images periodically. You can view these images as a movie when working offline (i.e. not connected to a scanner).

To watch a 3D image movie:

1. To the right of the 3D Log field, click [...] to browse for a 3D Log file from the *3DLog* folder. The movie is uploaded.

2. Use the movie controls to start and stop the movie.

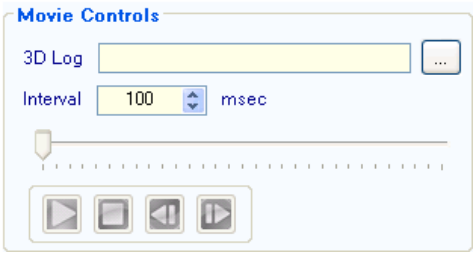


Figure 38 Movie Controls

The *Interval* field defines the amount of time that elapses between each image in the movie. Effectively, this is the speed of the movie.

Advanced 3D

The Advanced 3D tab displays the mapping points measured in the vessel.

The Advanced 3D tab is enabled in all permission levels except for Viewer mode.

The # column displays the scanner in the system to which each mapping point is associated.

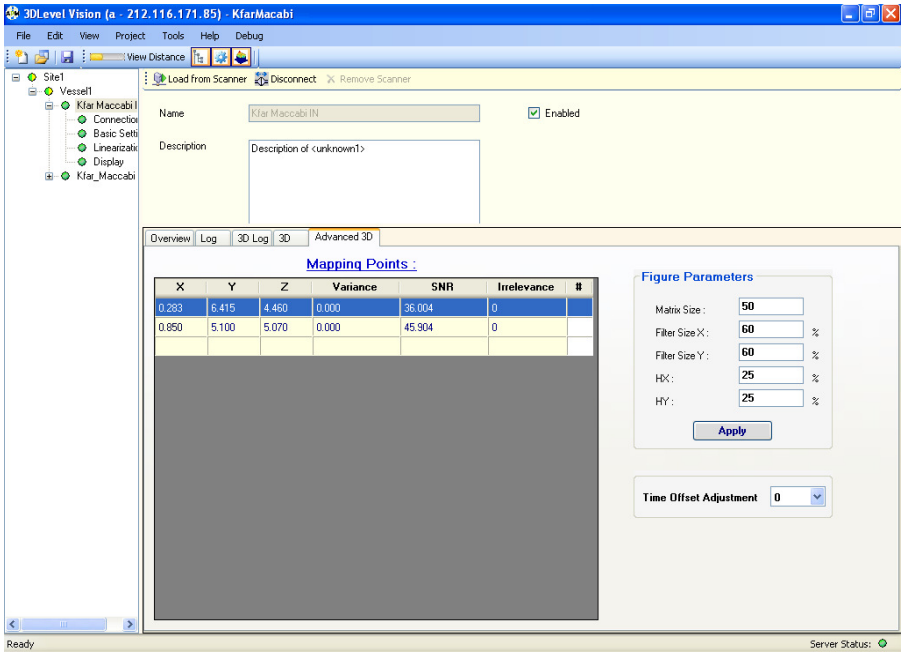


Figure 39 Viewing Pane – Vessel Level – Advanced 3D Tab

Scanner Level

To view the measurements of each scanner in a vessel:

In the project pane, click a scanner name. If there is more than one scanner, a list of all the scanners mounted to the selected vessel appears. In addition, the scanner level of the viewing pane displays all the measurement for the scanner. The displayed information is identical to that of the vessel level of the viewing pane. For more information, refer to *Vessel Level* on page 31.

Notes:

- When working with 3DLevelScanner types S/M/MV, there is only one scanner installed per vessel, so there is no unique scanner level for the viewing pane.
- When working with 3DLevelScanner type MVL, there is more than one scanner mounted on each vessel, and users with a suitable permission level can view the individual measurements of each scanner.

A

Software Menus

The following sections provide information regarding the options available in each menu of the 3D Vision application.

File Menu

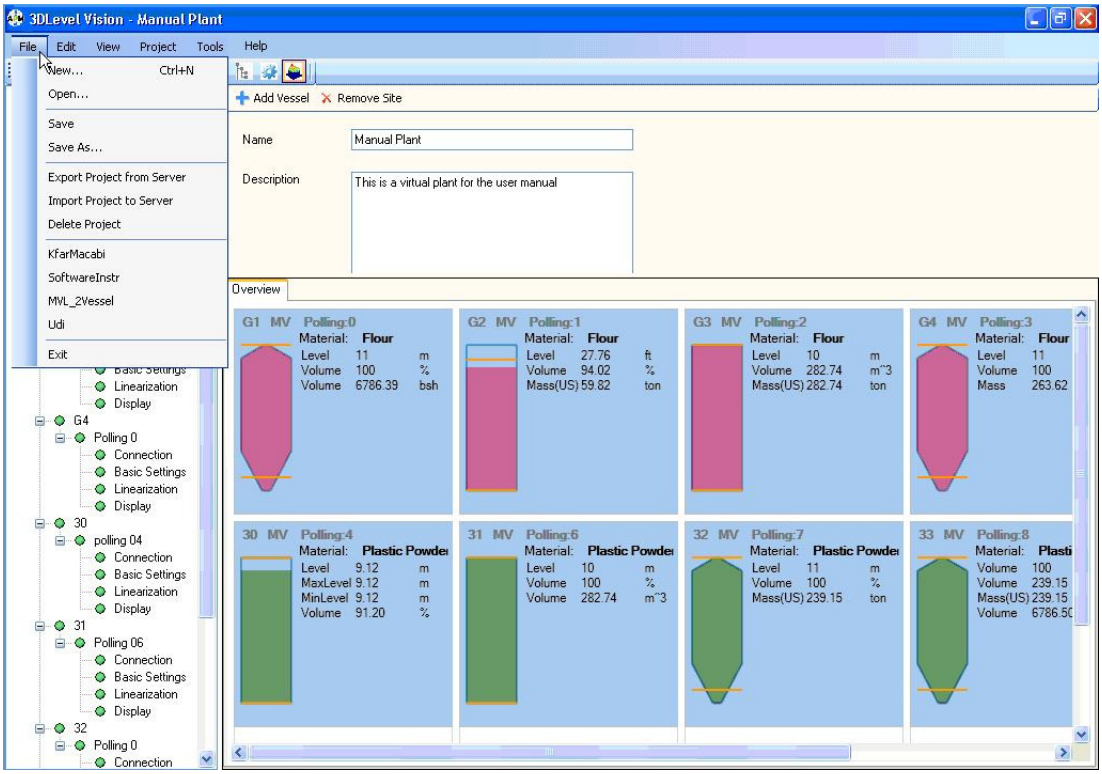


Figure 40

- **New** (Ctrl+N) — Creates and open a new project (all sites, vessels, and 3DLevelScanners undefined). The toolbar button for New is .

- **Open** — Opens an existing project for local browsing. The toolbar button for Open is .
- **Save** – Saves the present project. The toolbar button for Save is .
- **Save As** – Saves the present project under a different name.
- **Export Project from Multi Scanner Controller** – Downloads a project from the Multi Scanner Controller to the client PC. This function opens a list of all the saved projects in the Multi Scanner Controller, as demonstrated below.

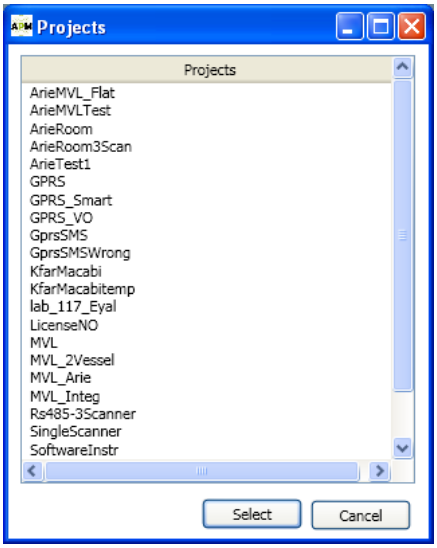


Figure 41 List of Saved Projects on the Multi Scanner Controller

- **Import Project to Multi Scanner Controller** – Uploads a project from the client PC to the Multi Scanner Controller. This function opens a browser for selecting one or more projects on the client PC to upload.

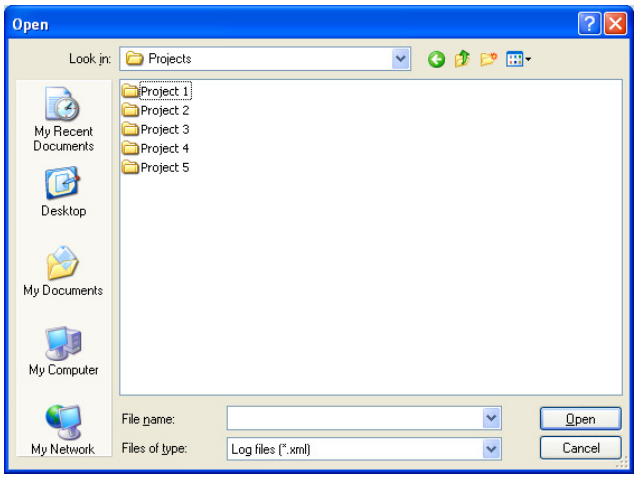


Figure 42 Browser for Selecting a Project on the Client PC

- **Delete Project** – Enables you to delete a project from the Multi Scanner Controller. This function opens a list of all the saved projects in the Multi Scanner Controller and enables you to select a project to delete.

The Import and Export functions are for maintenance and support. For example, a user wants to download a project to a local PC in order to make changes to the project, and then upload the edited project back to the Multi Scanner Controller.

- **List of recent projects** – Enables you to view a list of all the recent projects that were opened on your local PC.
- **Exit** – Exits the present project and closes the 3D Vision application.

Edit Menu

- **Add ►** – Adds sites, vessels, or scanners depending on the level selected in the project pane.
  - On the site level it adds sites or vessels.
  - On the vessel level it adds scanners.
  - On the scanner level it is disabled.

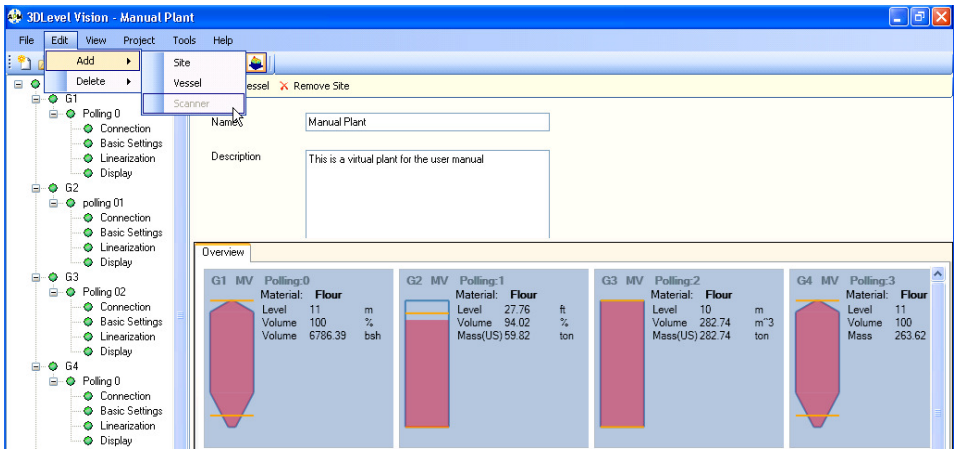


Figure 43 Edit Menu – Add Options

- **Delete ►** – Deletes sites, vessels, or scanners depending on the level selected in the project pane.
  - On the site level it deletes sites.
  - On the vessel level it deletes vessels.
  - On the scanner level it deletes scanners.

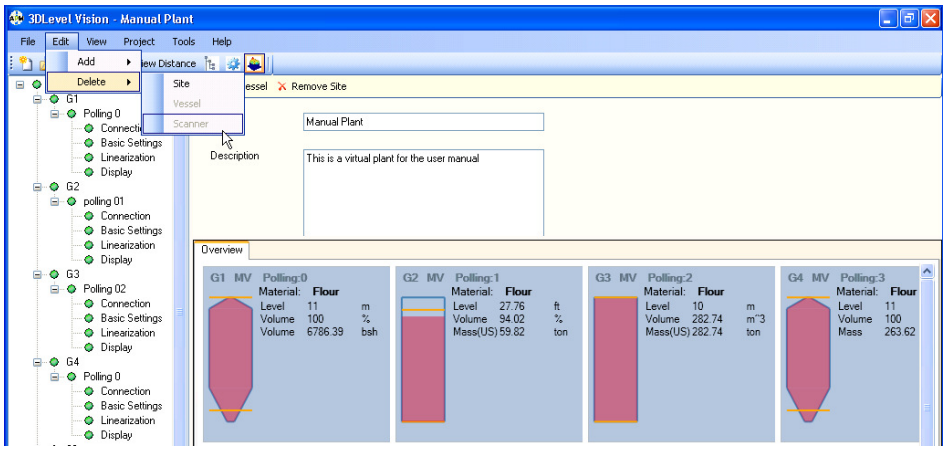


Figure 44 Edit Menu – Delete Options

View Menu

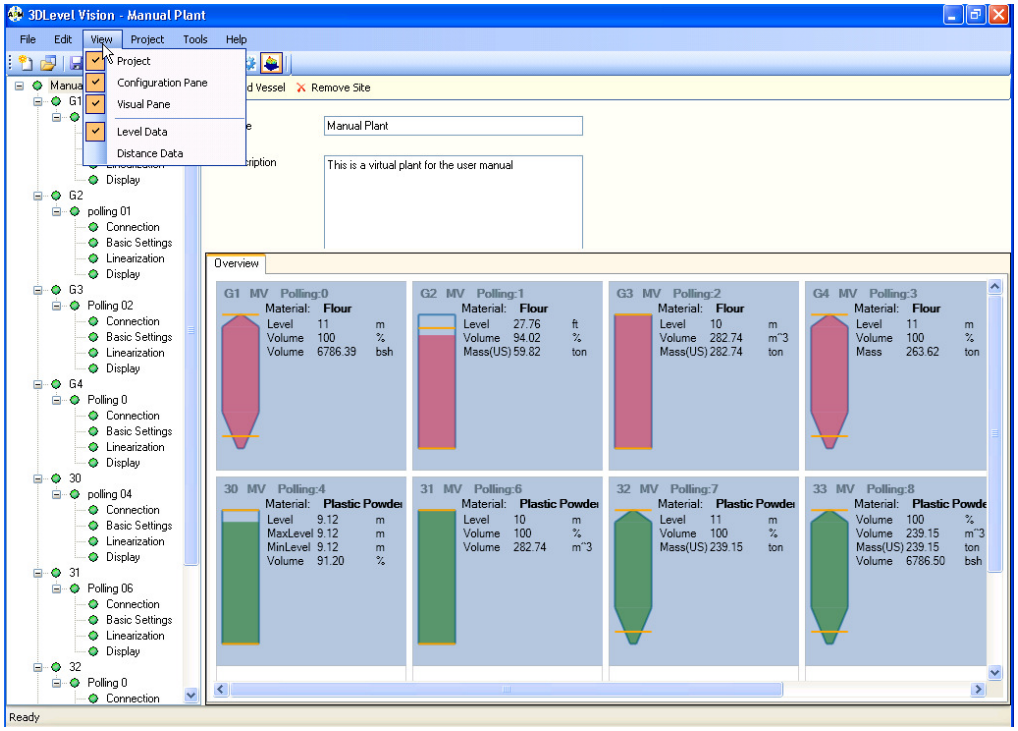


Figure 45 View menu Options

- **View Project / Configuration / Visual panes –** Enables you to display or hide panes. The View menu options of Project, Configuration Pane, and Visual Pane are equivalent to clicking , , and respectively.
- **Level / Distance Data** – Enables you to select either level or distance for displaying the quantity of material in vessels. The selection applies for measurements in all viewing panes, at all view levels, for the corresponding values (min / max / average).

  This can also be achieved by clicking View Level / View Distance.

In the figure below, D indicates “distance” and L indicates “level”.

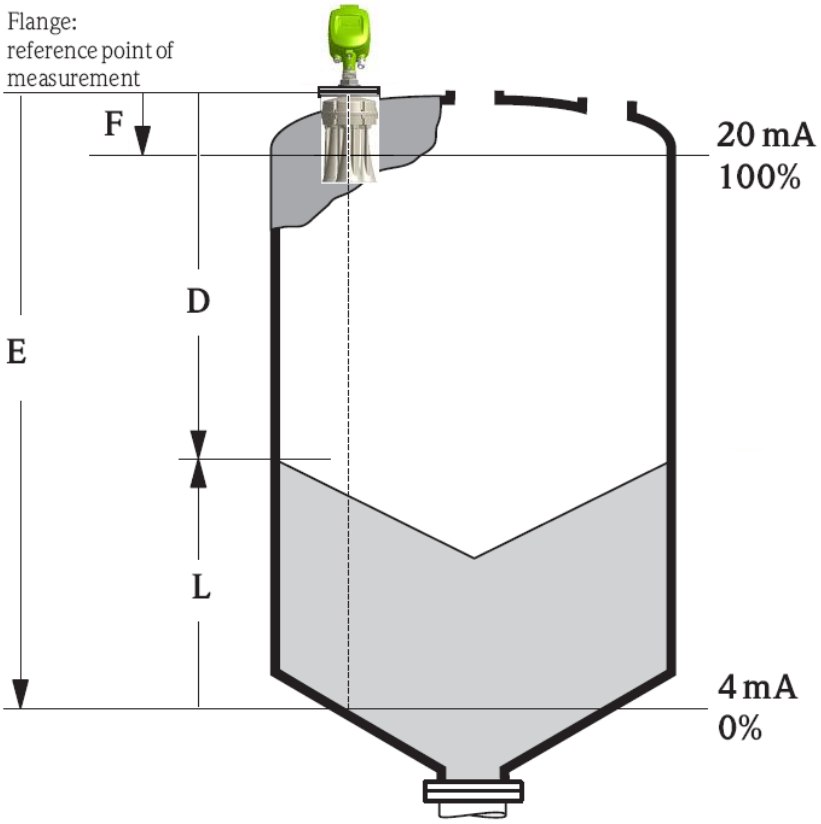


Figure 46 Distance Versus Level Diagram

Project Menu

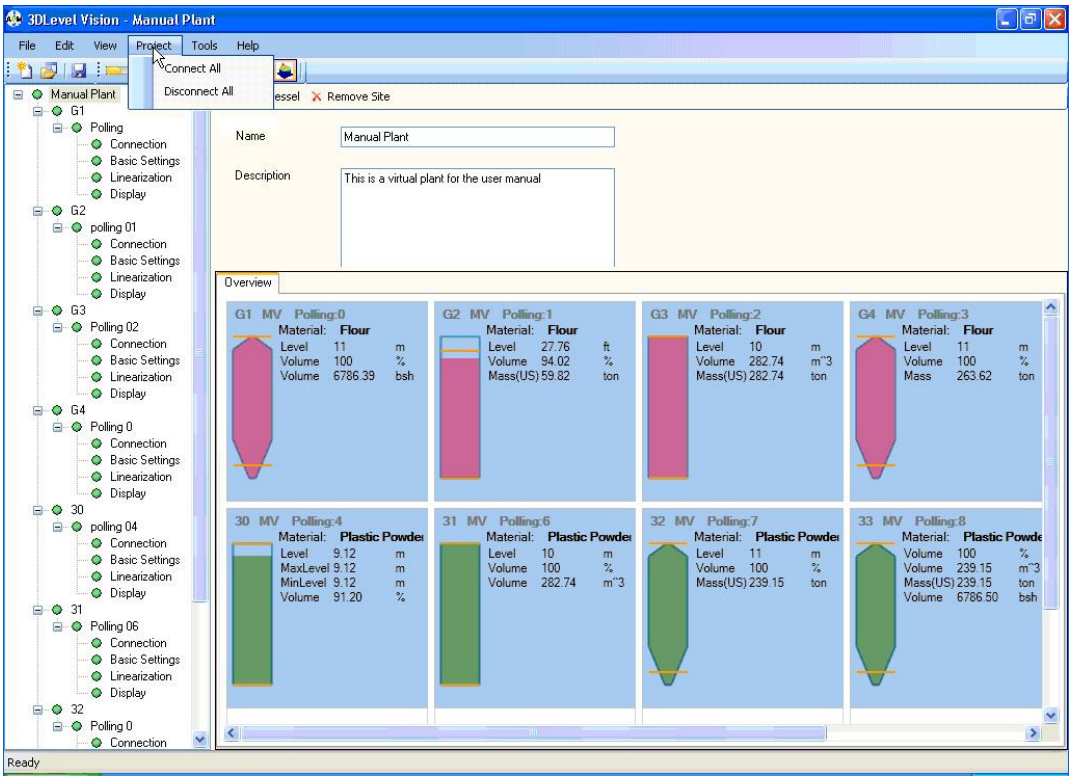


Figure 47 Project Menu Options

- **Connect All** — The project automatically connects to all the configured scanners (that were predefined in the connection options. For more information, see *Connection Settings* on page 26.
- **Disconnect All** — The project automatically closes communication to all scanners.

Tools Menu

The tools menu includes the reporting functions.

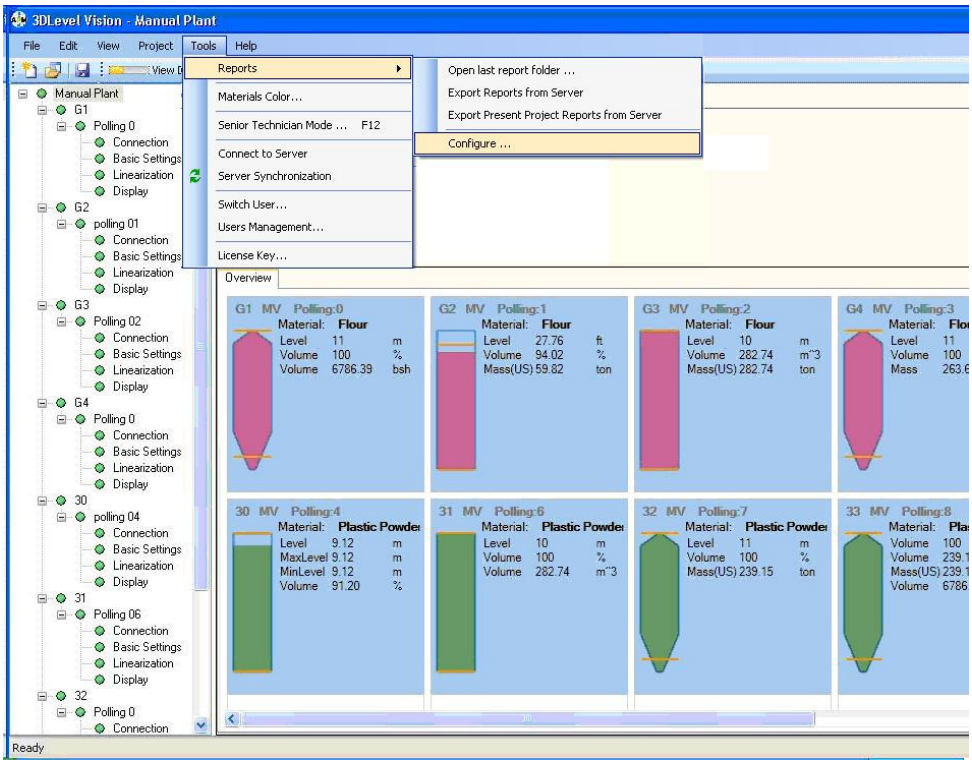


Figure 48 Tools Menu – Report Options

Managing Reports

The 3D Vision application enables you to create reports in Microsoft® Excel file format. The reports are generated online according to the report configuration.

The report options are:

- **Open last report folder** — Opens the local PC folder in which all Excel report files are saved.

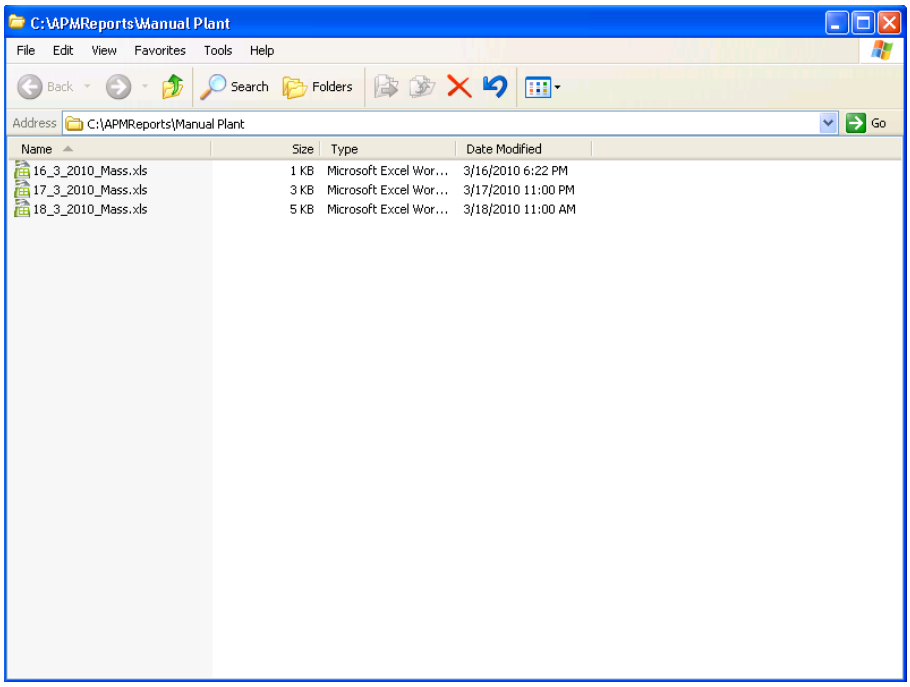

C:\APMReports\Manual Plant
File Edit View Favorites Tools Help
Back Search Folders
Address C:\APMReports\Manual Plant
Go
Name Size Type Date Modified
16_3_2010_Mass.xls 1 KB Microsoft Excel Wor... 3/16/2010 6:22 PM
17_3_2010_Mass.xls 3 KB Microsoft Excel Wor... 3/17/2010 11:00 PM
18_3_2010_Mass.xls 5 KB Microsoft Excel Wor... 3/18/2010 11:00 AM

Figure 49 Reports File Folder Example

- **Export Report Files from Multi Scanner Controller –** Exports report files from the Multi Scanner Controller to the client PC.

  This function opens a window with all the reports of all projects saved on the Multi Scanner Controller (Figure 35). Select one or more report files to download from the Multi Scanner Controller to the client PC.

- **Export Selected Project Report Files from Multi Scanner Controller** - Exports the report files of the present project running in the Multi Scanner Controller to the client PC.

  This function opens a window with the reports of the present project in the Multi Scanner Controller. Select one or more report files to download from the Multi Scanner Controller to the client PC.

In order to open report files on the client PC, Microsoft® Excel must be installed.

- **Configure** – Enables you to configure the report settings.

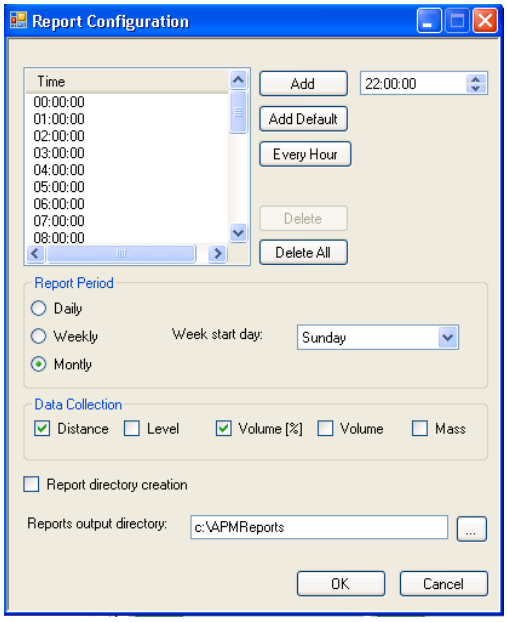


Figure 50 Report Configuration Window

The Report Configuration window enables you to set times when each report is generated, and define the measurements that are included in the reports:

- The top area of the Report Configuration window enables you to manually define the hours in which reports are generated per day.
- Alternatively, you can click *Every Hour* to define that reports are generated on an hourly basis over the course of a day.
- In the *Report Period* area, you can select whether reports are generated on a *Daily*, *Weekly*, or *Monthly* basis. When selecting weekly reports, in the *Week start day* field you must select the day in which each weekly period should begin.
- In the *Data Collection* area, select one or more of the following measurement types to be included in each report:
  - Distance.
  - Level.
  - Volume (%).
  - Volume – Based on the customer-defined unit.
  - Mass.
- Optionally, in the *Report output directly* field, you can modify the directory to which reports are saved.

Each generated report is saved as a separate Excel file in the defined reports output folder.

In generated reports, each row contains data for a scanner, and each column contains data for a point in time.

General Tools

- **Material Color –** Enables you to set the colors that correspond to the materials in vessels when displayed in the viewing pane.

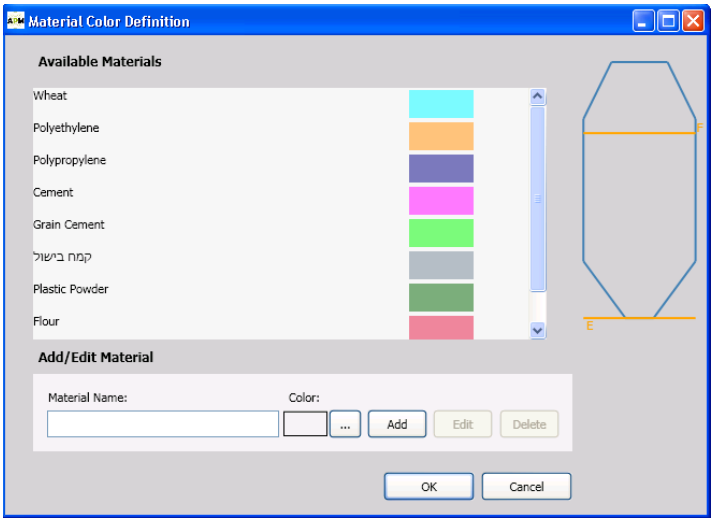


Figure 51 Material Color Definition Window

- **Senior Technician Mode -** Enables you to switch to Senior Technician mode, which provides advanced options for changing parameters. Switching to Senior Technician mode requires a password.
- **Connect to Multi Scanner Controller –** Closes the current connection to the Multi Scanner Controller and enables you to open a new connection to a different Multi Scanner Controller. You must enter the new server address and server port.

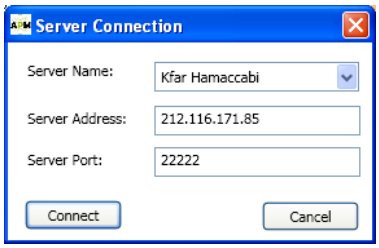


Figure 52 Server Connection Window

- **Server Synchronization –** Downloads and synchronizes all parameters from the Multi Scanner Controller to the client PC.

  For example, if other client PCs are connected in parallel to the same Multi Scanner Controller, and one client changes a parameter, the change takes effect for all clients connected to that server. Performing server synchronization synchronizes the settings on the client PC to the settings on the Multi Scanner Controller.

- **Switch User –** Enables you to switch between user accounts.

  This function opens a window to enter a new username and password. Doing so automatically logs off the current user and logs in using the new user account.

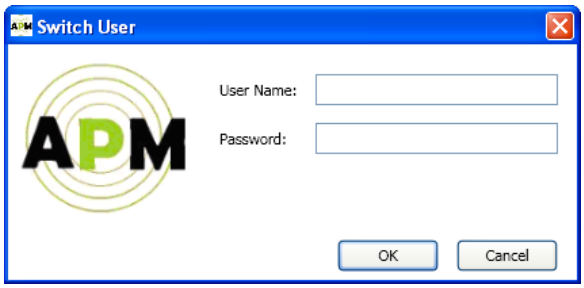


Figure 53 Switch User Window

Each user account has its own defined permission level. If you switch to a user account with a lower permission level, you will be more limited in the actions you can perform.

- **User Management -** This function opens the *Users* window which displays a list of all the user accounts defined on the Multi Scanner Controller and their permission levels.

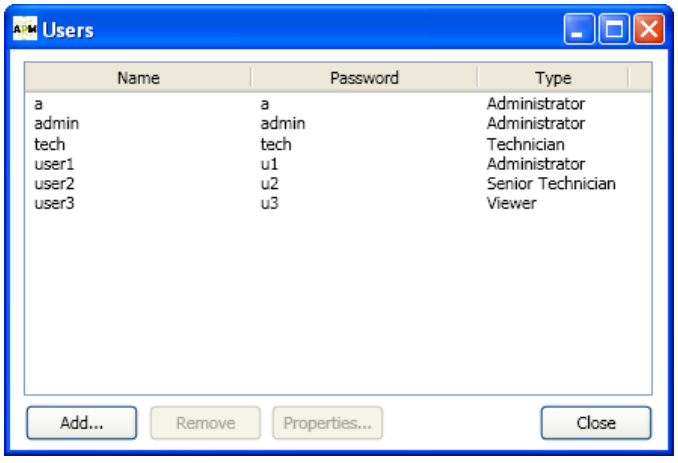


Figure 54 Users Window

The *Users* window enables users with administrator permission to add, remove, or edit user accounts:

- **Add –** In the *Users* window, click *Add*. The *New User* window opens. Define the username, password, and permission level for the new account, and click *OK*.

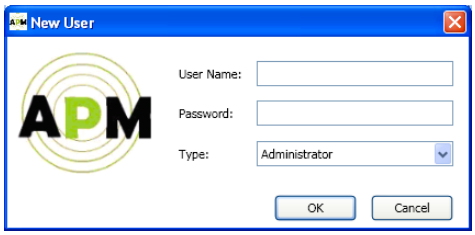


Figure 55 New User Window

- **Remove –** In the *Users* window, select a user account and click *Remove*.
- **Edit –** In the *Users* window, select a user account and click *Properties*. A window opens, enabling you to edit the password and permission level for the selected user account. Click *OK* to confirm the changes.

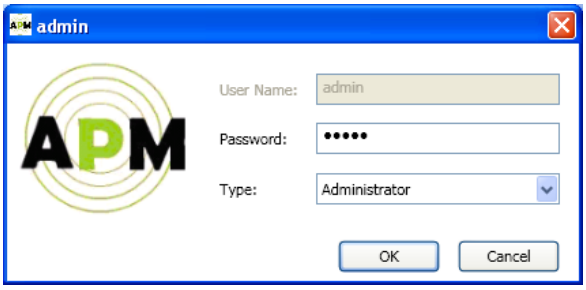


Figure 56 Editing User Account Properties – Example for User admin

- **License Key –** Enables you to upgrade from the single-vessel 3D Vision software license to the 3D MultiVision software license by entering a new license key. The change takes effect immediately and does not require a restart of the client PC.

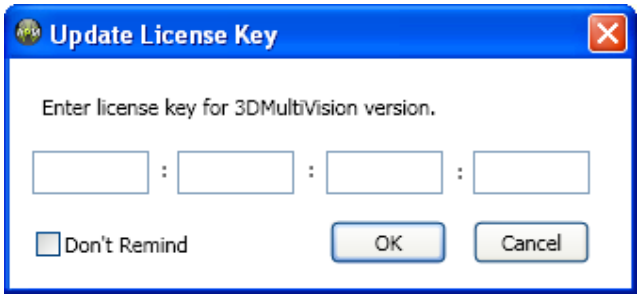
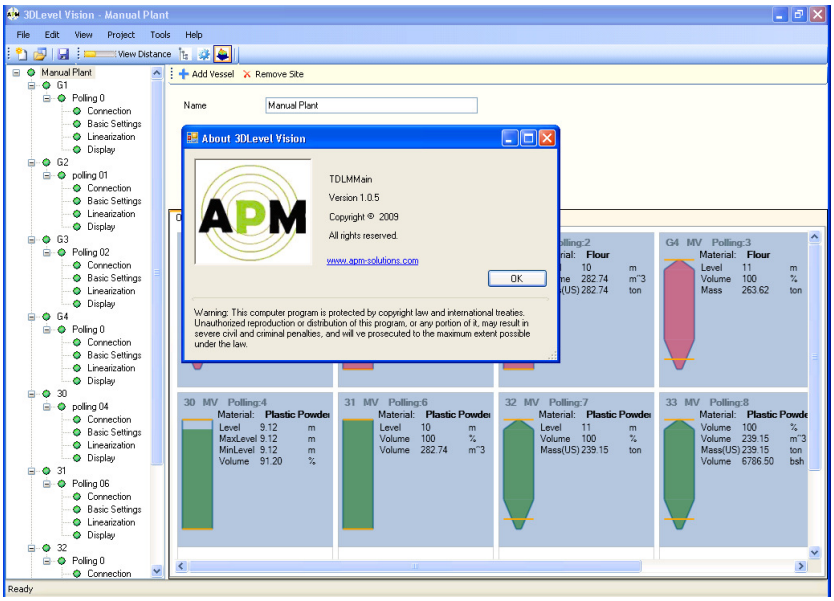


Figure 57 – license key window

Help Menu

- **About** — Displays the 3D Vision software version and support details.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Remove Site
Name
Manual Plant
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Figure 58 About Window

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